approach

MAY 1968 THE NAVAL AVIATION SAFETY REVIEW

By CDR W. A. Petry
NavAvnSafeCen F-8 Analyst

RF-8G (RF-8A)

SO THAT WE WILL NOT BE OUT

New	Old	Original
RF-8G	RF-8A	F8U-1P
F-8H	F-8D	F8U-2N
F-8J	F-8E	F8U-2NE
F-8K	F-8C	F8U-2
F-8L	F-8B	F8U-1E
F-8M	F-8A	F8U-1

F-8M (F-8A)

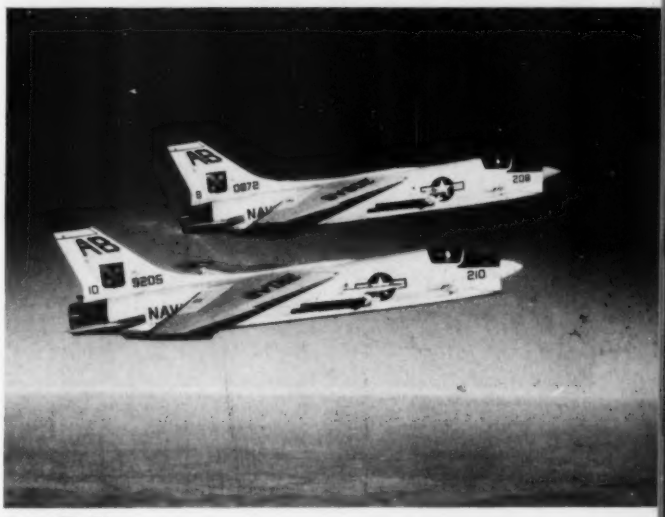
This reproduction of a sticker designed by the Vought Aeronautics Division of Ling-Temco-Vought represents the feelings of many *Crusader* pilots as they see the F-8 approach the end of its design service life. So that we will not be out of F-8s, a modification program is now being conducted by VAD at its Dallas, Texas plant that will be extensive enough to permit the aircraft to be extended for a second service life. The modification program is, of course, not based on a nostalgic desire to keep the high winged, versatile fighter flying. It came about because of the decision to keep 27C attack carriers operational until 1975. Of the Navy's operational and planned fighters, only the *Crusader* is compatible with the 27C.

The contract for the F-8 was let in May 1953 and the first aircraft flew in March 1955. During that first flight the aircraft went supersonic. The first production aircraft was airborne in September 1955 and Fighter Squadron 32, the first squadron to be equipped with the *Crusader,* deployed with the Sixth Fleet in February 1958. Since then the fighter has been assigned to Navy Air Groups which have operated around the world. The F-8 also became a primary fighter for the Marine Corps, which flew it from shore bases and aircraft carriers.

The F-8 was the first aircraft to set a U. S. speed record in excess of 1000 miles per hour, and in July 1957 an F8U-1P set the first supersonic transcontinental speed record. The aircraft refueled from the decidedly subsonic AJ *Savage.* Its average speed was 723.5 miles per hour.

The *Crusader* added to its already impressive air-to-air combat record in July 1967 when LCDR Bob Kirkwood scored a gun kill against a Mig aircraft in Vietnam. In that war, using guns, *Sidewinder* missiles, bombs and rockets, the F-8 has performed almost every mission assigned to strike aircraft, from fleet air defense to close air support. Navy *Crusader* fighter squadrons and photographic squadron detachments have operated from Yankee and Dixie station aircraft carriers and Marine *Crusader* squadrons are based at Danang.

Operated by Fleet Composite Squadrons, Air Development squadrons and NavAirSysCom activities,



F-8J (F-8E)

F-8H (F-8D)

the F-8 has provided radar tracking services, towed aerial targets and participated in tactical and missile development programs. The *Crusader* is the fighter aircraft of the Weekend Warriors, and is used by both Navy and Marine Reserve Aviation units.

Six basic versions of the *Crusader* have been built, all of which are equipped with Pratt and Whitney afterburning J57 engines. Originally built as the F8U-1, F8U-1E, F8U-2, F8U-2NE and F8U-1P, the designations were later changed to the now more familiar F-8A, B, C, D, E and RF-8A. The Alpha and Bravo were designed as day fighters. The F-8 Charlie had improved high altitude performance and was the first to have ventral fins. The F-8D had improved radar and an autopilot, while the Echo featured a more improved radar and the capability to carry bombs on wing pylons. The photo reconnaissance version was built as the F8U-1P and later became the RF-8A. A few F-8As were converted to drone control aircraft and designated DF-8Fs while the drone version itself is called OF-8F. F-8A number 74 was converted to a two-place tandem cockpit aircraft and is now called the TF-8A. In addition, 42 *Crusaders*, all fitted with boundary layer control, were especially built for the French Navy.

F-8K (F-8C)

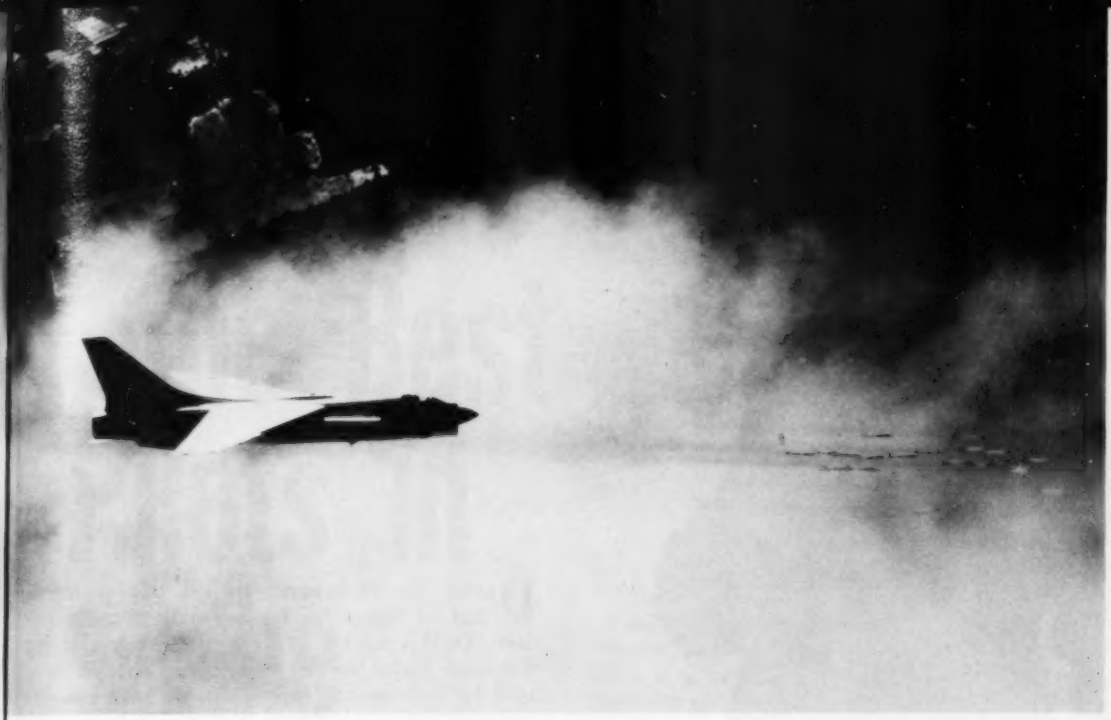
2

F-8L (F-8B)

The modification program will result in another change in the designation of the F-8 series. The new designations will be lettered G through M, with the letter India, which is not used in model designations, omitted. The new letters were assigned in the order that the aircraft are programmed to be modified, so the RF-8A became the RF-8G. The first of the fighters to be modernized, the Delta, becomes the F-8H. The Echo will be designated the Juliet after modernization and the Alpha, Bravo and Charlie will become the F-8M, F-8L and F-8K, respectively.

The RF-8G is flying now as the photo aircraft on 27C carriers. Fighter Squadron 51, based at NAS Miramar, received the first F-8Hs. In a letter to the Safety Center, LCDR H. E. Eddleman, Safety Officer of Fitron 51 said that the F-8Hs look and fly like new aircraft. He said that the pilots in the squadron are enthusiastic about the armor plating, and the separation of power control lines that will enhance survivability in a combat situation.

All of the fighters going through the modification program will receive an inspection that is equivalent to PAR and all outstanding service changes will be incorporated. Extensive electronic and airframe changes will be made to improve the aircraft's combat capability and survivability. Other changes are intended to decrease the maintenance effort required to keep the aircraft flying. The most significant modi-



An F-8E from VF-162 fires a salvo.

fication to all models will be the installation of a wing with a service life of 4000 hours. A new nose landing gear strut will be installed that is two inches longer than the present strut and which will absorb 10 per cent more energy. This strut will require 20" diameter tires instead of the present 22". The F-8H and J are programmed to receive improved main landing gear along with new tubular tail hooks. The other models will receive refurbished F-8E type main gear. All of the aircraft will have the capability of carrying external stores on MER/TER racks and the provision for electrical fusing.

The night flying capability of the K, L, and M will be improved with the installation of F-8E-type cockpit and external lights. *Crusader* maintenance officers will find their jobs simplified after the installation of internal starters and hard harness electrical wiring in the older models, which will bring them up to the standards of the newer ones. Approach Power Compensators will be installed in the Lima, leaving only the F-8M without APC. New catapult keels will be installed when needed to meet the new service life.

The separation of power control hydraulic lines and the provision for the installation of armor protection for critical areas will improve the ability of the H, J, and K to survive in a combat area. The Hotel will get electronic changes that will improve its offensive capabilities, but the most unique changes have been reserved for the F-8J. The old F-8E will not only have an improved radar and provision for external wing tank fuel, but it will have BLC (boundary layer control) installed.

BLC in the F-8 is a system that provides additional lift during takeoff and landing by routing engine bleed air over the upper surface of the flaps and ailerons. The system reduces the effective engine thrust, but permits the aircraft to be flown more slowly. BLC is designed to reduce the minimum approach and catapult speed by about 15 knots when compared with an F-8E at the same gross weight. While the modification program increases the basic weight of the F-8J, the BLC and the new landing gear should improve the aircraft's carrier performance.

The BLC is an extensive change. In addition to the ducting required to carry the hot engine bleed air to the wing, the slower approach speeds require other major changes. The leading edge droop will be modified and the angle of wing incidence will be reduced to maintain proper aircraft attitude at touchdown. The area of the UHT (unit horizontal tail) will be increased in order to give adequate longitudinal control at the lower landing speeds.

Admittedly, the modification program has created a bit of a problem with the new designations, but it is worthwhile to learn the new alphabet, because the "last of the gunfighters" will be a part of Naval Aviation for many more years. ◄

During one three-month period this command had 17 chargeable (operational) aircraft accidents. Of this number 13 were pilot caused. During this same period we have had seven aircraft damaged by their own ordnance. Also we have five aircraft and crews either missing or cause undetermined.

In just about every one of the above mishaps the CO of the unit and in some cases the group CO have described the pilot as "one of the best pilots in the squadron." If this is a true statement then we really have problems.

If the "best pilots in the squadron" are having inexcusable accidents, the future looks grim for this command. Before we start on this track let's look into this a little more.

Is he *really* "one of the best pilots?" Maybe a little honest appraisal would bring to light some additional facts which might change the CO's opinion. Or maybe he *really* is; if so, then let's look further. Is he being worked too hard—is he bored—is he tired (mentally/physically)? In other words, is he suffering from fatigue? Don't jump to accept this. Just because people are in a combat environment doesn't necessarily mean they are going to suffer from fatigue. How about complacency? (Webster says: 1. Quiet satisfaction; contentment. 2. Self-satisfaction; smugness.) Could this be it? Sounds pretty good. Matter of fact, one pilot, extremely well qualified, has admitted that he just allowed himself to get into a position from which he had no recovery (Charlie damage) by just being a little too compla-

One of the Best Pilots in the Squadron

cent. He further stated that he was lulled into this state by the fact that it was a routine flight, he had performed the same mission many times before and had never had any problems. So maybe this might be applicable to some others.

Of course you also have to consider the pilot who takes a chance, or cuts a corner thereby causing an accident (could be called displaying immaturity). The following is quoted from a safety publication: ". . . Sometimes in the past a number of people, when given the opportunity to exercise judgment, have done so in a completely selfish manner. They took risks which could never be justified by operational necessity and which resulted in the loss of life and destruction of combat potential.

"The records are full of accidents that were caused by apparently rational men who took it upon themselves to take risks for which they had no authority. There is no need to cite examples of these accidents. Anybody who has been reading accident briefs for any length of time has reviewed most of the gross examples. The problem is that there is really nothing new in pilot-caused accidents except a new crop of pilots committing the same errors over and over again. These errors are invariably committed when we believe the individual sufficiently experienced and mature to accept responsibility." Maybe we should check this one out.

Could it be a lack of command supervision, supervision at the flight leader level, or reluctance to properly brief, debrief and critique substandard performance?

There are probably other reasons why "one of the best pilots in the squadron" has had operational, pilot-caused accidents and/or unnecessary incident damage, but regardless of the reason we can't possibly tolerate these mishaps. The reason is, of course, that we are losing people and aircraft to accidents which drain our combat potential and also reflect adversely upon all members of this command. Every loss or accident we sustain affects our combat effectiveness.

So we say again—if the operational, pilot caused accidents and the unnecessary incident damage are being caused by "one of the best pilots in the squadron" then we really have problems. ◄

—Adapted from 1st MAW Aviation Safety Bulletin

To Get Aboard

". . . Roger 123, cleared to break, interval Ten o'clock crosswind."

"123 roger, out."

(Now . . . 45 degrees angle of bank, 70 percent, speed brakes out . . . watch the nose . . . there's 200 kts . . . little back pressure . . . 165 kts, gear, flaps down . . . trim, trim . . . wings level, looking good . . . 115 kts, okay . . . start the power up, 92 percent should do it . . . there we go, altitude is good, airspeed 110 . . . hey, it works. Okay, Tiger, don't forget the checklist. Fuel transfer complete, fuel 1500 lbs, have two gear visual, three indicated, lights out, flaps down, hook up, harness locked, brakes pumped firm, speed brakes out . . . okay, now fly it. Oh, oh, just about forgot . . .)

"McCain Tower, Grey Oak 123 abeam, gear down, over."

"Roger 123, cleared to land . . . aircraft ahead full stop."

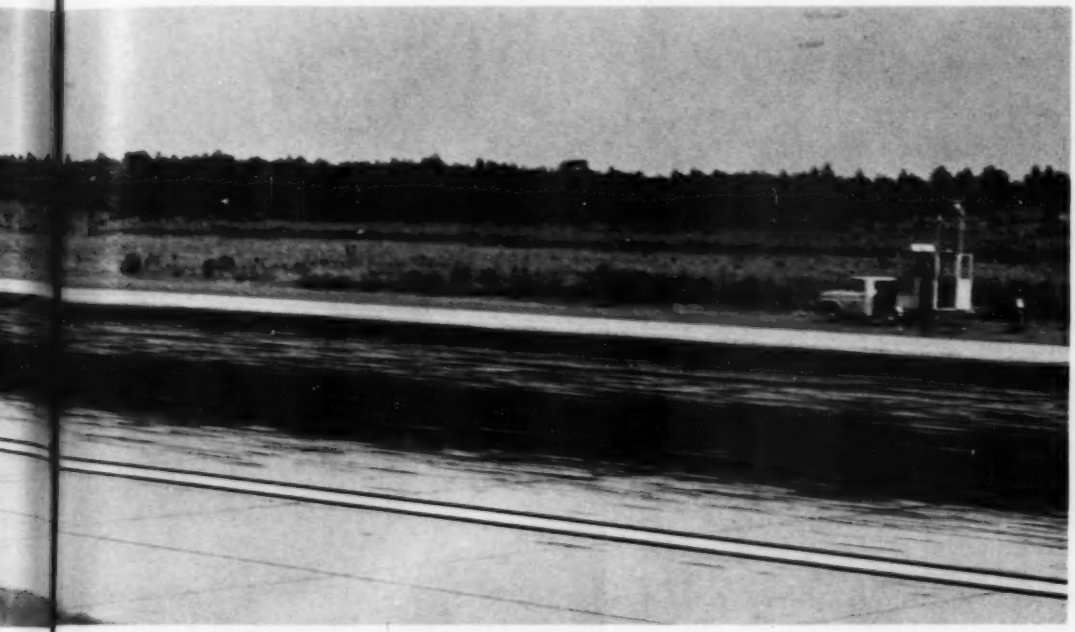
"123 roger, out."

(Okay . . . 80 percent, start my turn . . . there's the 90 . . . trim, 15 units coming up, altitude looking good . . . now for the groove . . . may be getting a little . . .)

"A little power 123."

(Yep . . . guess I was a little low . . . okay, line up right . . . 15 units . . . there's the box . . . don't flare . . . hold it . . . THUMP! . . . power idle . . . hold the nose off . . . Hey . . . I did it . . . I got aboard!)

By LT Mike Boston, VT-7



Flight briefs start with a discussion of the emergency brief of the day. This is followed with flight procedures for a specific type flight. In this case a section sequence brief for a formation solo flight, which the flight instructor will chase.

Thorough briefings concerning the T-2A ejection systems are given to all VT students prior to their first flight.

Students are assigned aircraft. Then they review all previous discrepancies prior to accepting the aircraft, noting any that may affect their flight.

Where did it all begin? Did you ever think about that, Junior Birdman? Who is responsible, where and when did it all begin? Technically it could have been many years ago. Perhaps after the first aircraft accident, when someone became concerned *why* it happened. Someone in aviation decided there should be a method, or procedures should be established to ensure safe flight operations. In any case, let's look at modern aviation and see just why you got aboard.

Your T-stage instructor for example was in your position a few years ago. Perhaps he was a NavCad or MarCad—you know, way back in the good old days. Since that time he has served in the fleet. He might be on his second or maybe even his third tour. The period he has served since he was in the "learning stage," as you are today, has been an important period in his life. He has accumulated many flight hours, and along with this, he has learned to respect procedures and conform to proper methods. He will not condone complacency.

A good preflight requires thorough knowledge of all aircraft systems.

Plane captain assists student pilot strapping in.

Today he is doing his very best to teach you to have the same respect for procedures. Sometimes you might question his methods of instruction. You wonder why things should be done in a certain way, why you must conform to the book. How, you may ask, will this make me a better aviator?

Your instructor is responsible for a "product." In any product, quality is of the utmost importance.

Number two in the flight taxis out to join lead in the marshalling area.

When he demands precision, demands that you know your procedures cold, demands that you have a good knowledge of aircraft systems, flight regulations and emergency procedures, he is doing his part to ensure that you "get aboard."

On the other hand, if you do your part, study hard, discipline yourself for precision, perform satisfactorily in all respects and consistently strive for the very best, you are in fact also responsible.

Your training, both ground and flight, evolves around safety. All phases, including meteorology, aerodynamics, transition, aerobatics, basic instruments, radio instruments, formation and tactics, are all concerned with safety. That terrible stall sequence you had to master, the course rules you had to know cold, the proper scan in basic instruments, the complicated procedures of radio instruments, the underrun procedures in formation flights, the respect for thunderstorms, the thorough preflight, power vs altitude, attitude vs airspeed. All these things gathered up through years of study and experience are taught to you to provide for your safety and to ensure that the Navy and Marine Corps receive the top "product"—the exceptional aviator required in today's modern aviation.

But wait one! Let's not forget the men who get you into the air. The enlisted men who, on a day to day basis, pre-flight your aircraft, maintain your engines, troubleshoot the electrical, electronic and hydraulic systems. The men who ensure that your survival equipment is in proper order. They too are vitally concerned with your safety and are responsible when you "get aboard."

The flight complete, students check in with the Operations Duty Officer. An extensive debrief follows which will include all items covered on the flight.

We can truly say from the airman all the way up to the C.O., everyone around is concerned with your safety and is responsible for the fact that you "got aboard." All hands in the Training Command are putting forth a great effort to provide you with the very best instruction and the best maintenance possible. The rest is up to you.

You are responsible to yourself. You must learn and continue to learn. To make all of the pieces fall into place, you must do your part in becoming a member of the very best professional team in the world, Naval Aviation. ◄

ON THE GLIDE SLOPE

The Blip Disappears

A cup of coffee and a cigarette were the best remedies to ease Ensign Neverfear's apprehensions as he waited in the ready room to man aircraft for the 2200 launch. What would a night cat shot be like? Day operations were easier than he'd expected and one of the best RAG LSO s in the business had made carquals seem simple.

As Neverfear rode the aft escalator to the flight deck, he checked his survival gear and flashlight for the umpteenth time, hoping they'd be the most useless items aboard. The primary divert field was listed as Santa Catrina Island and our intrepid aviator had the tacan approach memorized and tucked securely in the plastic inset on his kneeboard.

The flight deck was brightly lighted and preflighting the A-4 was easier than expected; however, the air surrounding the ship was the blackest he'd ever observed. The inkwell atmosphere, coupled with the possibility of a fog bank in the operating area, made the forthcoming carqual period a defiance of the elements in the truest sense.

A split second after the green wand touched the deck, Neverfear felt the catapult stroke commence, and he knew that there'd be no backing out now.

A past history of excellent performance in the instrument phase of the RAG syllabus was reassuring in this totally hostile environment. Penetrating the fog bank shortly after the cat shot was a bit disconcerting; however, everything was fine at this stage of the climbout.

The check in with CCA at marshall was gratifying, and he knew that someone really cared about his whereabouts. Neverfear was subsequently advised that there would be a delay in the recovery due to worsening fog conditions and to conserve to the maximum extent possible. A rapid mental calculation of fuel remaining and distance to the divert field revealed that he could hold for approximately 40 minutes.

Several trips around the marshall pattern provided excellent practice in timing. The rotating beacons above and below him indicated that the other A-4s were firmly established at their proper points in space and Neverfear wondered what the other pilots were thinking about after their first night cat shots.

The relative tranquility of a constant instrument scan was broken by a voice from below informing Neverfear and the other A-4s that the qual period had been cancelled due to weather conditions. Their orders were to bingo to Santa Catrina, bearing 130/95 miles.

After completing the turn toward the divert field initial approach fix, our intrepid aviator noted that his fuel gage registered 2800 lbs. This would leave 2200 lbs at the initial, with at least 1700 lbs on deck; a comfortable margin, provided no delays were incurred.

The initial call to Santa Catrina tower disclosed a slight delay for an approach due to other bingoing aircraft. A GCA would be required due to weather conditions of 300 x ¾ in fog. Neverfear entered the published holding pattern at FL 200 to await his turn.

Upon receiving clearance for his approach, Neverfear commenced his penetration and switched to the assigned GCA frequency. The GCA controller informed him that a special weather observation showed the ceiling as 200′ with visibility ½ mile and deteriorating. A glance at the fuel gage revealed 1950 lbs which would still allow just enough to make it to a mainland field, should it be necessary.

Passing through 2800′, the A-4 became solidly IFR. The GCA controller was calm and reassuring as the young aviator concentrated on flying the best possible approach. On glideslope, Neverfear heard that the field had just gone below minimums and the A-4 in front of him on final had taken a missed approach. He elected to continue to minimums, in hopes of sighting the runway threshold.

As the pressure altimeter unwound to the precision minimum altitude, no runway lights appeared. Neverfear added full power and commenced his waveoff with a growing feeling of anxiety. His fuel was down to 1500 lbs and the nearest field to Santa Catrina was NAS Maramount, some 65 miles distant.

He switched immediately to Los Angeles Center and requested a radar vector to Maramont with a climb to FL 180. Center promptly read back the clearance and stated that he could expect an enroute descent and a GCA final to runway 24 at destination.

The climb to FL 180 was normal, with the exception of weak reception of L. A. Center. A rapid calculation of fuel required to Maramont left an estimated 650 pounds on deck. This approach had to be right. Neverfear wished that he'd had the foresight to put the approach plate for Maramont on his kneeboard prior to launch; however, with radar handling all the way he wouldn't need it.

When he was 20 miles northwest of Maramont, Neverfear was handed off to approach control and told to descend to 3000′ on a heading of 070 degrees. During the descent, the controller stated the current Maramont weather as 800 overcast 2 miles visibility, with tops reported at 3800′. No sweat with a good GCA!

Upon level-off at 3000′, heading 070, Neverfear inquired as to his position in relation to the field. Approach control stated that the field was bearing 190, 7 miles, and to expect a turn to base leg in 6 miles. With a fuel state of 950 lbs, the situation began to look considerably better for the first time that evening.

Neverfear droned onward heading 070 for several minutes. Anxiously anticipating the turn onto base leg, he keyed the mike to contact approach control. No side tone!

Another try!

No side tone!—No reception!

In the approach control blue room, the GCA pattern controller frantically tried to make radio contact with Neverfear. Repeated calls on assigned frequency and Guard channel were to no avail. The A-4 was well past the turn point for base leg, heading for mountainous terrain. Why wasn't he intercepting the tacan final approach course?

Back in the cockpit, Ensign Neverfear was trying to pull the approach plate book from the Nav packet. Realizing the lost comm situation, he now had to make an abbreviated tacan approach—and rapidly—for fuel was becoming critical. If only he had the approach plate on his kneeboard and the Maramont tacan tuned in. A red light on the panel caught his eye! What was the radar alti . . . ! ➤

If you have any questions regarding instrument flight procedures, send them to:

Commanding Officer
VA-127
NAS Lemoore, Calif. 93245

ROTATION is not a Game

In the NATOPS Flight Manual, jet aircraft have specified "rotation" (nose lift-off) speeds for every takeoff weight, and if pilots take this seemingly friendly word too lightly, they may find themselves in a great deal of trouble.

Old World War II prop jocks developed many unsafe habits out of complacency once they had conquered the takeoff torque problem. One of these was pulling the aircraft off the deck as soon as they could. Fortunately, the prop wash effect helped make such "boot strap" takeoffs quite safe. The plane would often hover, and sometimes shudder, on the edge of a stall for a few seconds then quickly and safely accelerate to a comfortable flying speed.

When the first operational jets came along however, some pilots let their appreciation of the new aircraft's better characteristics overshadow their plans to cope with its several significant deficiencies. The happily noted improvements were the absence of propeller torque on takeoff and considerably faster top speeds. The casually regarded deficiencies were slow acceleration at takeoff and the dangers of "boot strap" liftoffs. Consequently, there was a rash of too many accidents as the result of premature nose lifting before the term, rotation-speed, came into common use and the proper techniques were stressed.

Prop and Jet Takeoff Differences

Propeller driven aircraft had better takeoff qualities because the cross-section area of prop-wash was about 10 times that of a comparable jet engine's thrust. Granted, the jet thrust had about 10 times the velocity of prop blast but during the relatively slow acceleration to takeoff speed, broad area blast was more efficient and effective than confined jet thrust. Once airborne and accelerating, however, the jet engine comes into its own.

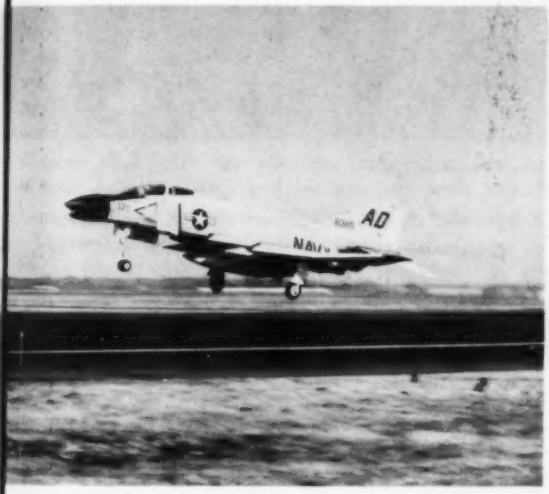
So, if a pilot attempted to "boot strap" an early jet off the runway by rotating the nose too soon, the nose wheel usually obeyed but nothing else did. The pilot in his original jet checkout was already unnerved (although most had been forewarned) with the slow acceleration compared to his World War II fighter, so when the beast continued to be a ground lover, his anxiety to get airborne often took over. Then overrotation seemed to be the only answer.

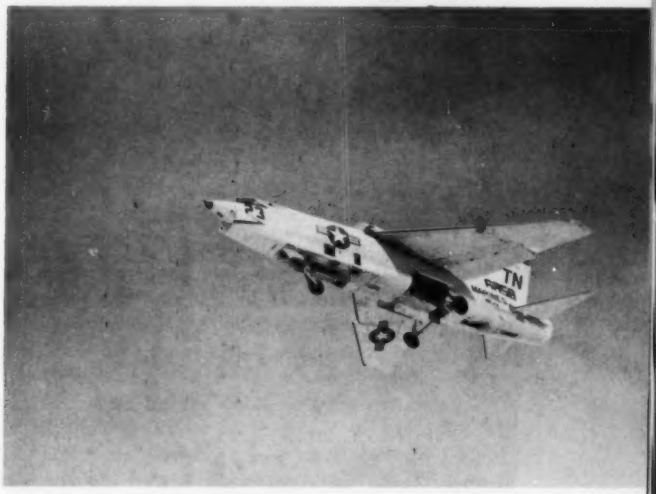
In aeronautical terms, a prematurely rotated jet was on the back side of the power curve. The wing was in a stalled condition and the thrust could not overcome the excessive drag. In essence, barn doors were bucking the wind. End result—some sort of a crunch off the end of the runway.

In later years, more powerful jet engines, many of which are additionally blessed with afterburner features, have helped minimize the "back side of the

Most naval aviators originally associated the word "rotation" with a game of pool. In modern military aviation, however, the word is used with much more serious connotations.

power curve" problem. If, however, pilots work at it on certain models, they can still rotate prematurely and join the incident/accident files. In the interest of eliminating this needless and yet well understood type of trouble, some recent mishaps are narrated here.





Precise use of checkoff lists made these takeoffs routine.

A FAM Pilot Gets in Trouble

An experienced pilot was assigned to the rear seat of an F-4J to assist a new pilot in his first familiarization flight. After a thorough briefing, the pilots manned the aircraft. All start and preflight checks were normal with the exception of an intermittent illumination of the PITCH AUG warning light. The light was reset by the Fam pilot in the front seat and the *Phantom II* left the line. Upon taking the runway and running up the engines, the AUG light came on again but another reset seemed to solve the problem.

Following completion of engine runup the Fam pilot went over his takeoff checklist. As briefed, takeoff was in MRT (100% rpm without the assistance of afterburner). After rolling about 1500′ and indicating 90 kts, the pilot rotated the nose so high that the stabilator tips scraped the runway. At the time, this was unsuspected by both pilots, but the instructor nevertheless cautioned the front seat man to ease the stick forward. The Fam pilot quickly complied and reduced the angle of attack too much (about 5 degrees) so that the instructor then said to bring the nose back up a little more. Again the instructions were obeyed.

Acceleration continued and after rolling 3700′, the aircraft lifted off at 135 kts. After zooming to about 75′ in an extremely nose-high attitude, the aircraft uncontrollably banked about 25 degrees left and then quickly snapped over the other way to about 50 degrees right wing down. These gyrations alarmed the instructor who, without controls in the rear seat, could only yell corrective orders to the Fam pilot over the ICS. After several frustrating efforts to coach the Fam pilot, the instructor realized that a stall/spin condition was imminent. Instant ejection

He survived the takeoff ejection.

was the only solution at that dangerously low altitude so the instructor yelled, "Get out!" twice.

Following the 50 degree right bank just above the runway, the *Phantom II* fell back to the pavement heading 30 degrees to the right of the takeoff direction. About this time the instructor punched out. Aircraft impact was on the right external fuel cell, right main mount and nose wheel. Departing the right side of the runway, the troubled ghost began to shed parts: landing gear; external fuel tanks and weapons racks. The drop tanks ignited upon impact and burning fuel outlined the aircraft's route. The front cockpit was still intact when the mess came to rest. Flames engulfed the rear cockpit which were rapidly extinguished by the quick crash crew. Miraculously, the Fam pilot got out unharmed. The instructor's chute worked as advertised but he returned to earth in the trail of blazing fuel. He received painful burns but not fatal injuries.

The Fam pilot had had one demonstration flight in the rear seat where, unfortunately, there was no way for him to have been given dual instruction. The accident occurred on his first front seat hop which, of course, was his first flight at the controls. The board concluded that the briefing had been proper in every respect for the flight and that pilot factor was the main cause of the accident.

The flap handle in the front cockpit was set on the correct ½ position when the wreckage was inspected. Regardless, the Board concluded that the sequence of unorthodox events on the takeoff (as determined by the stabilator initial impact point) could only have occurred if the flaps had been, in fact, UP. Consequently, the final opinion persisted that the flap handle had been jarred into the ½ position on impact with the runway. Accordingly, both pilots were held at fault for not insuring that the flaps were in the specified ½ position. If the flaps had been ½ down, the board felt that the aircraft would have gotten safely airborne.

Such takeoff accidents occur so rapidly that there is little time for corrective action. A yell from the instructor for afterburners might have saved the day had the pilot been equally quick in his response.

Afterburner to the Rescue

A similar potential accident in an identical model airplane almost imitated the first mishap except for the fact that the flaps were properly set at ½ and the pilot was quick enough to resort to afterburner assistance. Like the first accident, the replacement pilot in the front seat overrotated his *Phantom II* and when the tip-off, wing-rock phase of the impending stall/spin commenced, both pilots went into instant but different actions. Simultaneous with the application of CRT by the front seat man, the checkout, and controlless pilot in the rear pulled the face curtain. Fortunately, the low altitude ejection worked as advertised and the only casualty was the

cockpit canopy. The aircraft recovered into a normal climbout which was followed by a precautionary and safe landing.

Trouble Comes in Threes

An old wives' saying often quoted is that "Trouble comes in threes." A third *Phantom II* proved the adage by having a similar accident due to overrotation within a month of the two occurrences narrated above.

The F-4B pilot was departing a location other than his home field accompanied by his wingman in a similar model aircraft. The strange base coupled with abnormal starting events threw some well known habit pattern interruptions into the act. Accordingly, something was bound to be overlooked unless a double effort forced extra care in exercising checkoff lists in their entirety. The flaps were overlooked and left UP, and the AFCS was left engaged.

At about 3000′ of roll the pilot began easing back on the stick, but the two forgotten items had set the stage for trouble. The AFCS engagement caused the stick to be unusually hard to pull back while the clean flap condition allowed faster rotation to a higher-than-normal angle of attack. The hard-to-move stick gave the pilot the impression that his controls were frozen and he was not quick enough to prevent a wing-rock, which was the beginning of the inevitable stall/spin maneuver.

Both crews quickly and safely ejected but unrepairable damage resulted—all because of the old bug-a-boo, incomplete or hurried use of the checkoff list.

Hot Pilot

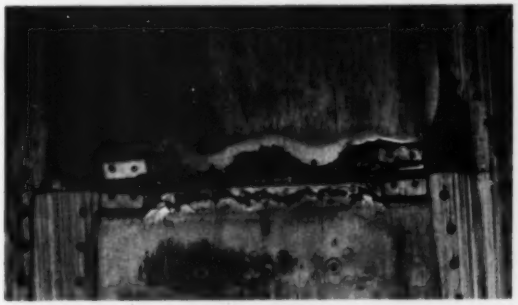
F-8 aircraft on occasion also seem to be easy victims of overrotation. One such accident recently occurred because the pilot of the *Crusader* let professionalism slip in favor of showmanship. The takeoff checklist had been properly completed and a smooth AB takeoff roll was underway. At about 125 kts, the pilot pulled back on the stick, thought he was airborne and raised the gear. Unfortunately, the premature rotation put the plane on the back side of the power curve so it settled back onto the pavement. The wheels were on their way up so there was nothing to prevent the underside of the fuselage from striking the runway.

In the days before afterburners this might have been a good crunch but the controlled explosions in burner quickly overcame the drag and won the game of acceleration. After some airborne inspections, it was ascertained that a safe but precautionary landing could be made. A routine field arrestment was accomplished without any additional damage to the aircraft. Minor repairs put the *Crusader* back in an operational status.

Forgetful Pilot

Another *Crusader* pilot was not so lucky because besides over-rotating, he forgot his wing leading edge cruise-droops on the checkoff list. Here is another case of habit pattern interruption.

The F-8 lifted off at the specified speed so the pilot was fairly quick to snap up the gear. When the wing was lowered without the cruise droop having been previously selected, the pilot overrotated, thereby putting the wing at too high an angle of attack. Without the help of the droops, even the powerful AB could not save the day and it was inevitable that the aircraft would settle back onto the pavement. The end result was a crunch off the end of the runway and strike damage to the aircraft. Fortunately, the pilot got out unhurt.



A scraped tailpipe. . .

. . . led to this.

Rotation Is A Serious Word

Several of these narratives demonstrate that premature takeoff rotation can cause an accident even if nothing on the checklist is forgotten. All of the accidents demonstrate that, in spite of improved thrust and the addition of afterburners, rotation speeds of jets must be adhered to as religiously as the checkoff lists. Although modern jets are vast improvements over prop jobs, they have some unforgiving restrictions, and one of the most important of these is "rotation." ◄

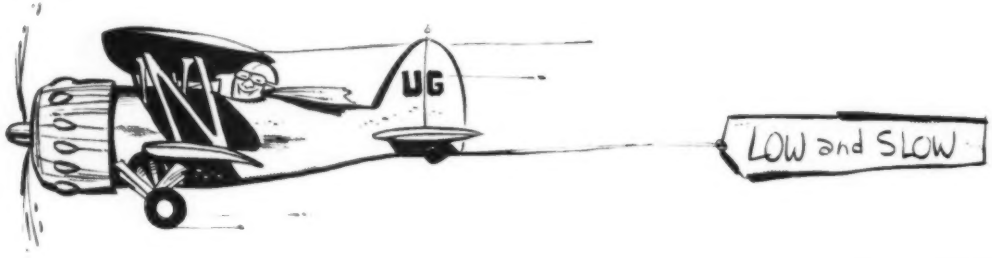
Great Aviators I Have Known

By LCDR C. F. Clark

Speed Ring

The late, great Speed Ring, was one of our early daredevils of the air. He broke several air records during the late 30s, a few hearts and some noses—in that order. He was best known for his rapid taxiing, takeoffs and climbs. "Partner," he used to whisper, "I ain't got no time for the check list and other frivolous things 'cause it's my nature to do things fast!"

While performing an outside reverse Immelmann with a snap roll at the top, he fell from his aircraft due to his failure to fasten his lap belt and shoulder harness. Speed's remains are buried in Minneapolis, St. Paul, Milwaukee and Peoria for those of you interested in paying homage to this great ace.



LCDR Red (Nose) Rudolph

Remember LCDR Red (Nose) Rudolph whose cry of "Gear down and welded" was a familiar reply to the challenge of all west coast GCA operators? Red had so many gear-up prangs that the airframes chief welded the wheels of his XR-50 in the DOWN position. Red's motto was "Low and Slow." He was true to his word as the Puget Sound Power and Light Company found out the night he blacked out the Olympic peninsula when he dragged his wheels through the high tension wires at Grand Coulee and caused the main bus to fuse with the Northern Pacific railroad at the Wenatchee freight yards.

Anymouse Special

Check Ride

Zero five fifteen is early anywhere, but somehow it always seems a little earlier, and the bed looks a little more comfortable when you're due for the first launch. Flight quarters were scheduled for 0600 so there would be ample time for the "personal routine" and a cup of coffee to wake up. By 0546 four bleary eyed pilots had assembled in the wardroom for the mission brief. Space is at a premium aboard the Navy's modified patrol boat reconnaissance (PRB)/helo support LSTs, so the wardroom doubles as a ready room as well.

The previous night an Army sub-sector advisor had radioed the ship that he had received some new intelligence which might help us find an elusive V. C. sampan's position. For the past three days our PBR patrols had been receiving sporadic automatic weapons fire from one general area along the river, but repeated reconnaissance by both PBR and helos had been fruitless. We were hopeful that this information might at last lead us to Charlie's lair. Nothing would please us more than to awaken Charlie with the sweet sound of our 2.75-inch rockets exploding in his carefully concealed position.

The duty steward had been late in rising and no fresh coffee was available in the wardroom, so flight quarters were moved back to 0615. Detachment SOP specifically forbids takeoff prior to our morning coffee!

At 0615 flight quarters sounded and we made our way to the aircraft. The early morning rays had begun to lighten the skyline, the horizon was well defined and the prevailing morning westerlies seemed to be about 10 knots. The "T" was facing upriver and the two UH-1B gunships were parked athwartships facing port.

Both crews manned their aircraft, and as was customary, the forward helo turned first. The start, runup and checks proceeded smoothly, and the only discrep-

ancy noted was that the right fuel boost pump light was not operating. A second check of the fuel system indicated that the pump was functioning properly, and that the light in the caution panel was burned out. With everything "in the green" the pilot gave a thumbs up to the LSE, and the first helo launched into the morning sky.

The second *Huey* crew systematically prepared their aircraft so they could start as soon as the first helo was clear. Glancing to his right the copilot remarked, "Looks kinda dark off to the right."

"Yeah, it sure does," replied the aircraft commander. Even a remark like this was no cause for alarm because most mornings in the Mekong Delta have less than ideal weather.

The first *Huey* had now assumed a circular orbit over the ship at 500′ to await the fire team leader's launch. During the third orbit the pilot of the airborne gunship noticed that a dark squall line was rapidly approaching the ship. He continued to observe the nearby storm and finally decided to call the second aircraft which was still on deck.

"55, this is 58. Request you remain on deck and shut down. We've got a pretty bad storm approaching, and I'd like to land back on board before the ship gets sucked in."

"55, Roger, I concur. Shutting down."

The airborne helo had to wait until the other *Huey's* rotor could run down and be made secure before receiving a "green deck." However it seemed that the storm had no intentions of slowing its steady advance, and the crew soon realized that it would be a race right to the tape. The pilot immediately began to maneuver the aircraft into position for a long, straight-in approach to the forward spot. The squall line seemed to be gaining on the ship and when it was about 350 yards off the ship's beam the pilot elected to discontinue the approach due to obscuration on the flight deck.

Both the pilot and copilot were Jaygees, and neither had a great number of flight hours. The aircraft commander had 690 total flight hours with 10 hours total actual instrument time, and the copilot had 460 total flight hours with 4 hours total actual instrument time. Rain, by now, had

completely engulfed the ship and the aircraft commander chose to fly to the southeast toward the open sea. The squalls extended for several miles on a distinct arc, and a wall of rain appeared to extend from the surface to 1500′ with heavy cloud formations overhead. At its extremities the storm seemed to be less dense, so the pilot decided to proceed farther out to sea, hoping to outrun the storm's flank. Two minutes later the error in this choice became apparent. The pilot then tried to establish radio contact with another LST on an adjacent river in hopes of finding either a haven, or at the least, a weather advisory. Repeated attempts at radio communication failed, and the pilots found themselves being forced farther out to sea by the advancing storm. The squadron's home base was located on a peninsula about 45 miles away, but the storm line was advancing in that direction and looked as though it would soon engulf that route of escape as well.

Throughout this period intermittent radio contact was maintained with the home LST. The last radio transmission had advised that although the storm front was quite wide it did not appear to be very thick. In fact, the weather at the ship had cleared considerably. The *Huey* was now surrounded on three sides by the storm, and the only reasonable alternative seemed to be to attempt a penetration. A low level penetration seemed unwise due to the heavy rainfall and the lack of a radio altimeter. Although virtually all safety articles and lectures stress avoiding storm penetrations whenever possible, the fuel state at this point necessitated a prompt decision.

There was a saddleback high in the cloud formation which seemed the most likely point for entry. The UH-1B, although certified for instrument flight, has two glaring weaknesses; it has neither automatic stabilization equipment (ASE) nor a radar altimeter. Prior to their entry into the clouds each crewman divested himself of his body armor and donned a mae west. A brief resume of emergency ditching procedures was given by the pilot. The pitot heat, force

trim and lights were turned on, and the crew prepared for entry. Both pilots had anticipated entering the storm at 4000′ but on their arrival they found conditions at that altitude unsatisfactory, so the ascent was continued. At 7500′ it became apparent that a further climb would accomplish nothing and would only waste precious fuel. With RPM at 6600 (normal) and airspeed at 65-70 knots to reduce the effect of turbulence, the *big check ride* was about to begin.

Although their precise geographical position was unknown the crew elected to fly an initial course of 340 degrees. This course should have intercepted the land adjacent to the river at some indeterminate point. Thus, if an emergency landing was necessary it would more than likely have ended on land rather than on the water.

At 7500′ the IFR entry was commenced at 0655. The first minute passed without consequence, but during the second minute the aircraft encountered heavy rain and moderate turbulence. At this point the pilots discussed the possibility of making a 180-degree turn, but decided to proceed. It was now 0658 and they agreed to continue holding their present course and altitude until 0710. The rain and turbulence soon subsided to quite tolerable levels, but the total IFR conditions prevailed.

During this period both pilot and copilot were on the controls, and although there were instances of pilot induced cross controlling, the net result was quite satisfactory. The concentrated efforts of both pilots were required to overcome a tendency to fly left wing down. At about 0700 the left door gunner announced that he could see water below. This report was followed by a second report, even more encouraging than the first: "Sir, I can make out the shoreline."

The shoreline gradually becam visible to the copilot as well, an a 500 fpm descent was begun. Th cloud cover was still intermitten Rather than proceeding on cour during the descent, the pilots elec ed to make a spiral descent ove the partially clear area. The pil continued a total instrument sca while the copilot attempted t maintain visual contact with th ground and occasionally cros check the pilot's progress. Passin down through 4000′ visibility in creased significantly and the rat of descent was increased to 100 fpm. At 2000′ the aircraft passe below the overcast into light rai —but it was finally VFR!

The ship appeared about thre miles to port and the trip wa made at 1500′ without further in cident. When the pilot finall touched down on deck the fu gage read 350 lbs. As the roto slowed down two happy crewme leaped onto the flight deck. It wa now 0722, exactly one hour an 5 minutes since takeoff.

The pilot, flashing a big smile turned to the copilot with an out stretched hand and said—"Shake baby, we just got an UP on th *big check ride!*"

Copilot's Summary

At the time of the incident th parent squadron had ordered, but not yet received, both radar al timeters and rotor brakes. Had both aircraft been equipped with rotor brakes, it is altogether rea sonable to assume that the second helo, still on the deck, would hav been able to shut down quick enough so that the one airborne would have been able to get aboard before the storm engulfed the ship. In addition, a radar al timeter would have made the IFR sorties of the flight infinitely easier. Also, it would have con tributed substantially to the emo tional well being of two frantic young pilots. ◄

What's New

Remote Scoring Strafing Target, Device 3C49C

Front view of console control with battery connection cables.

Device 3C49C is a new trainer that will electronically record hits on a target in a remote location. This device is designed to give fighter pilots target practice for improving marksmanship. The advantage of a target of this type is that personnel do not have to keep running to the target to count the hits. Another advantage is the fact that hits are scored when they strike the target. This enables the range to notify the pilot immediately of his success or failure.

Present target panels consist of a sheet of conductive neoprene rubber, bonded to plywood. However, a study is being conducted on a thermoplastic which holds up much better than the present plywood target. This new material is extremely durable and has possibilities of lasting five times longer than the present plywood target. The device can reliably record two impacts .005 seconds apart or 200 rounds per second.

FORUM:

Wonder Where the Yellow Comes From?

Is there a directive concerning generators which have been painted yellow? We have been receiving generators for TS-2A aircraft from supply which were once painted yellow but have been repainted black.

There are two schools of thought on this matter here:

(1) "If it has been through overhaul, it's okay for aircraft use."

(2) "If it has been painted yellow, it can never again be used in an aircraft."

Neither group can find anything in writing to justify its stand. Who is right?

AEC P. N. SMITH
VT-31 QUALITY CONTROL
NAS CORPUS CHRISTI

▶ Research of this matter failed to uncover any directive which supports either group as stated, but the following facts should put you at ease.

If a generator is processed by NARF and made ready for issue (RFI), it will have passed all inspections and tests and will be accompanied by an accessory card, which records the incorporation of applicable avionics/electrical bulletins and changes. This generator will be painted black, the same as other engine RFI accessories. On some generators, yellow, blue or green dots, 1-inch in diameter are used to readily indicate that certain changes have been incorporated. In any case, the generator is certified for aircraft use by the accessory card, and the Federal Stock Number Technical Supply Management Code (TSMC) is designated by the letter "Z."

The question arises: How do certain accessories or components acquire a coat of yellow paint? This can be traced to Mil-S-8512B, Military Specifications for Special Aeronautical Support Equipment which specifies that exterior paint shall be orange-yellow, color 13538 (Fed Std 595). Also, NavDocks P-300, Transportation Manual, requires that all vehicles used on aircraft ramps be painted yellow.

In many cases, accessories such as generators, hydraulic pumps on Ground Support Equipment (GSE) are identical or are compatible with similar components on airframes and power plants and therefore, receive the yellow equipment paint treatment. If the accessory is for GSE only, the TSMC is designated by the letter "R."

An exception to accessories of the type just mentioned is the case of aircraft batteries. The criteria for retaining or rejecting aircraft batteries is spelled out in NavWeps 17-15BAD-1, Naval Aircraft Storage Battery Manual. Batteries which fail to meet specifications for aircraft use may be used in ground power carts. To readily identify such batteries, their cases are also painted yellow.

3-M Manual Prescribes Electric Shop/Line Procedures

Our electric shops are divided into two sections: 220 (line) and, 620 (shop). The problem:

Use of shop test gear and test components on aircraft. Many of the 620 test benches require the use of aircraft system components to test various systems.

The 220 people continually borrow the components (which we mark Yellow) to troubleshoot the aircraft.

This practice in turn creates two problems.

1. Many of the components are damaged by the electrician in the course of doing the work or by the actual

Will Light Water Freeze?

This question was recently put before Naval Research Laboratory experts.

The answer is: Yes.

This problem has been worked on without success. But it was determined that Light Water fire extinguishing units can be provided with insulation to prevent freezing for about 24 hours. In addition, heat from an outside source could be furnished the unit.

At the present time, NRL is working to develop an additive to be used with Light water so it can be mixed with salt water. Additives with the most promise for use with salt water also depress the freezing point of the mixture. In other words, if a suitable additive is developed so that Light Water can be used with salt water —this additive will also prevent freezing of the units when below freezing temperatures are experienced.

Do you have a question regarding materials or procedures now in use in Naval Aviation? For an answer send it to FORUM, U.S. Naval Aviation Safety Center, NAS Norfolk, Va. 23511.

cause of the gripe.

2. The line electrician, finding that the test component is in better shape than the existing part, will switch parts, thus giving the bad part back to 620.

The latter is a rather serious problem and means that 620 must either repair the component to maintain his own test bench or order a new part for the test gear, neither of which should be necessary.

Are there any directives on this subject? If not, a third opinion on this situation would be appreciated.

R. S. BIVINS AE-3

▶ Adherence to maintenance procedures prescribed by the 3M (NMMMS) Manual should take care of the problem.

Work Center 220 (line) is Organizational Level Maintenance whereas Work Center 620 (shop) is Intermediate Level Maintenance (Appendix D of the 3-M Manual).

Chapter 3, Section 4, Paragraph 31402.12 prescribes in detail the correct procedures to perform and document a maintenance action. Whenever a repairable component is removed because of suspected malfunction, it must be processed to Supply on multicopy MAF. A component removed for test and check (scheduled maintenance) will be turned in to IMA on a 4710/7 form as noted in paragraph 31402.4. Line test equipment should be available for check and test (troubleshooting) on the aircraft from IMA work center 620. Shop test equipment should not be removed for this purpose.

Unlike the flight control systems on present day high performance aircraft—the Naval Aviation Safety Center desires a continued feedback.

Has information in any Safety Center publication ever helped you to prevent an accident, avert an injury, or deal with an emergency in a better way?

If so, and you have not already informed the Safety Center, it is particularly desired and important that you do so. Such feedback is vital to all departments at the Center and for fiscal support of our safety research and education program.

E-2A NATOPS

It has come to my attention that there is no set procedure for use by E-2A types concerning the inflation of the Mk-3C life preserver prior to water entry or the release of the seat pan via the left lower rocket jet fitting. There is no NATOPS procedure concerning this. However, Deep Water Environmental Survival Training given to E-2A crewmen during training in the RAG suggests that the Mk-3C should not be inflated prior to water entry nor should the seat pan be deployed.

Is it not true that F-4 types inflate their Mk-3Cs and deploy their seat pans? Once the chute opens, we all become the same (A-4, F-4, E-2A types) and a standardized procedure should be set forth.

LTJG S. C. EVANS
ASO VAW-114

▶ You are correct on NATOPS procedures for the F-4. At the present time, consideration is being given to use of the chest pack parachute in the E-2. This would affect the type of life preserver worn. Our suggestion is that, in the meantime, you propose an interim NATOPS change to the E-2 NATOPS model manager, RVAW-110 at North Island.

Steel-Toed Shoes

Recently we tried to get issued some steel-toed safety boots. Our squadron power plants chief was informed that not everyone was entitled to them. It seems to us that safety should be for everyone.

ADJ2 PATRICK M. MURPHY
ADJ3 HENRY ROBERTSON, JR.
ADJ2 RICHARD SATTRELL
VA-216, NAS LEMOORE

▶ According to the Section "H" Allowance List, NavWeps 00-35QH-2, the allowance is one pair per each individual engaged in the performance of bomb loading and other hazardous aircraft maintenance and servicing tasks. Issue is at the discretion of the type commander. A further check disclosed that ComNavAirPac message 142102Z of December 1967, "Shoes, safety toe, FSN 908430-753-5635 series," to all ComFAirsPac grants authority to approve issues on subject shoes in accordance with the Section "H" Allowance List. ◀

PASS IT ALONG!

Each copy of APPROACH is meant for ten readers.

BULLETIN B

By LT T. A. Myers, AS

FOD Kills the Mission!

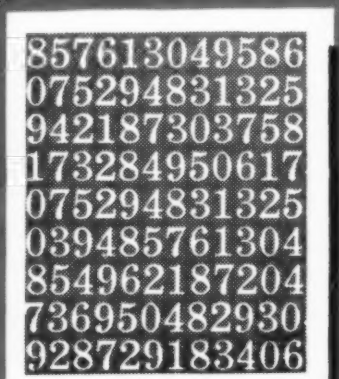
Some things you might do differently from some

A well thought out bulletin board can do a tremendous job for a Safety Officer's program, and there is a definite advertising psychology to be considered in using the board to its best advantage.

The safety posters published by the Safety Center have a limited use in an "active" bulletin board. These posters are constructed in such a manner that it isn't necessary to read them to know what they are trying to tell you. This can be a virtue in one respect and a hindrance in another, particularly if you intended for someone to read it. These posters are more suitable for bulkhead "glance" type safety advertisements.

In what I call an "active" bulletin board, I use pictures not obviously related to aviation safety to get attention. The word content of the poster is used to teach or remind. The use of advertisement layouts from a variety of magazines can provide interesting and attention-grabbing subjects. As in all advertisements the goal is to catch a person's eye and at least get him to stop and take a quick look. If this is accomplished, the battle is nine-tenths won. I have found that an aviator will almost always stop and look at a picture of either a female (in good taste, of course) or an aircraft of any kind.

Once you have the prospective student of safety stopped in front of the board you must keep him there with a series of interest-holding items, intermingled with the important thoughts that you want him to leave with. You must make both of these items short, interesting, and to the point. The entire board should have only two or three items containing numbers if you expect any retention at all. I have found this to be the maximum that one can use without boring your prospective student and causing him to merely scan the items instead of reading and remembering them.



Don't end up just a number. . .

MAKE IT!

Security used to be a jar of 'Grams' home made jelly, now it's your INFLIGHT NATOPS GUIDE!

THI

TIN BOARDS

A. Myers, AS[illegible] VT-23

. . . . NATOPS shouldn't be one of them!

It is interesting to note that color, (the brighter the better) can be an eye catcher in itself. After noticing an eye catcher, the person's scan then starts in the upper right-hand corner of the display and continues clockwise. It pays to arrange the board with your important items between others of lesser consequence.

Another item useful on an active bulletin board is a poster where any one can write his own title. These "participation" items draw attention and bring people back to the board several times to see what their contemporaries have written. Then they are exposed to the information again and their interest is maintained.

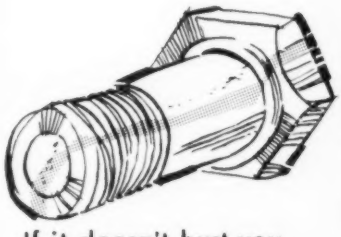
The placement of a bulletin board can also make or break your campaign. You must have it in a place that your readers frequent. It must be easily reached also to allow for careful reading of the small print and the addition of comments and titles.

Items of a physical nature which can be very effective in your advertising program are the actual aircraft parts themselves. For example, if your program this week is on FOD, a most appropriate poster would contain a bent turbine blade. This brings the problem or example closer to the individual you are trying to reach.

A product used in civilian advertisements that can also be used effectively in safety work is the moveable sign. This is made of a small electro-magnet operated from one flashlight battery. These can be obtained from a variety of retail stores and generally at no cost to you. All you have to do is ask for them.

All in all, there are a variety of items, methods, and innovations that a Safety Officer can use to make his accident prevention program one that works—for his pilots and for the Navy.

Even the experts can have a midair.



If it doesn't hurt you
when it falls out -
it will when you suck it up. . .
BEWARE FOD!

Take care of it and it will take care of you.

HINK

. . . and live!

Radio Rescue

"After I bailed out, it seemed like my mind was working about a second behind my senses, somewhat like a movie sound track which is a few frames late." So begins the survival narrative of the photo-navigator of an RA-3B which went down shortly after 2130 in mid-ocean. Without going into the circumstances necessitating the bailout of the crew, let us follow the experiences of the only survivor until helicopter rescue 5½ hours later.

"When I was falling free," the survivor continues, "I realized that, as I went out, I had seen the glow from the aircraft's lights and had heard the engine. I did not see or hear the aircraft after this. Then, suddenly, I was thrown about violently. Seconds later, I realized that the parachute had opened automatically.

"After the chute deployed the first thing I did was to take off my oxygen mask and let it drop down. (I had bailed out at 6000'.) Because I had read that flying gloves are slippery in the water, I took mine off and put them in my pocket. I must have forgotten to zip the pocket because when I looked for my gloves later, they were gone and the pocket was open.

"I turned my matrix light on and released my lower left rocket jet fitting. The seat pan swung down to my right. I grabbed it and pulled the ring to open the seat pan. With the ring still in my hand, I followed the attached lanyard down to the raft and inflated it. Then I tried to hook the raft to my torso harness. I couldn't find the clip on the lanyard so I just held on to the raft. I began to oscillate slightly in the chute and tried to hold the raft so that it would act as an air brake to stop or at least decrease the oscillations. This seemed to work.

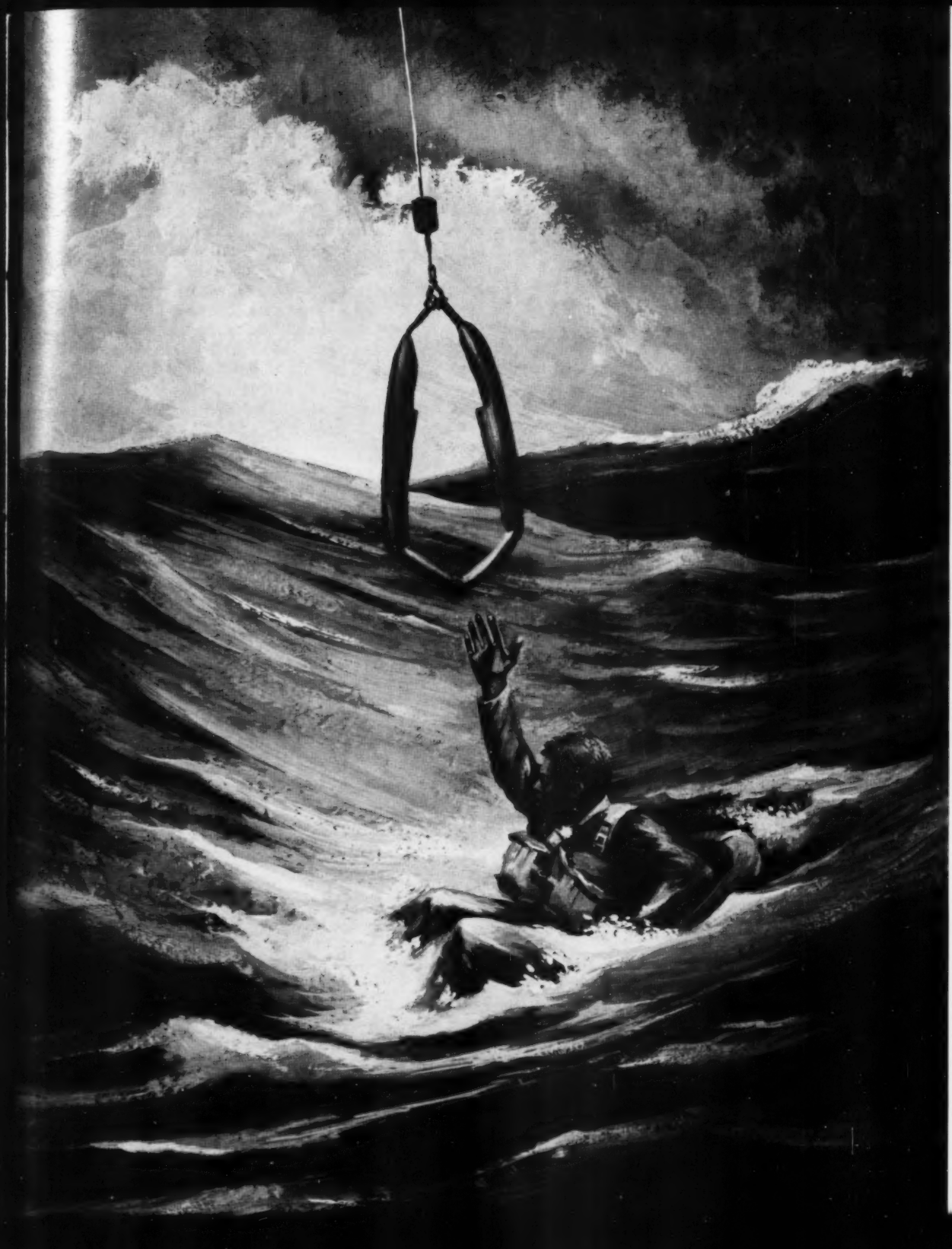
"Aboard the carrier some months before, I had seen an A-4 pilot eject over the ship. It had seemed like 20 minutes before he finally hit the water so I thought I would have plenty of time. I was wrong. After what seemed like only 4 or 5 minutes I was under water. It was the biggest surprise of my life. I pulled the toggles on my Mk-3C and came to the surface. Later I found out that my Mk-3C had not inflated, either because I hadn't pulled the toggles hard enough or because the Mk-3C had malfunctioned. *(The vest inflated after the survivor's rescue. —Ed.)*

"The raft was in front of me upside down with the parachute draped over it. I was neck deep in the sea and swallowing salt water and getting tangled in the shroud lines. It was all I could do to stay above water by hanging on to the raft. A wave hit me in the face and washed my helmet off the back of my head so that the chin strap was around my neck. I took off my helmet and held on to the strap with my left hand and the raft with my right. I started to go under and must have let go of the helmet when I grabbed the raft and started to paddle back to the surface.

"I realized that I was rapidly becoming exhausted and that I had to get out of the chute and into the raft. I began feeling for the chute fittings but couldn't find them or the right seat pan fitting either. Finally I found the seat pan fitting over where the left one normally is. Then I found the chute fittings down near my waist and released them.

"I managed somehow to kick the shroud lines from around my legs. Finally free of those terrible nylon clinging vines, I began to think about getting the chute off the raft but when I looked, the chute was gone. I flipped the raft over, turning it until the small end was in front of me. I knew I had a good chance if I could only get into the raft. I managed to pull myself into the raft and just lay there for 15 or 20 minutes. Finally I turned over and settled myself and began to think again.

"I got the RT-10 radio out of my survival vest and established contact with the SAR aircraft. After turning the beeper on for 30-second periods, much vectoring on my part, and firing a few tracers and the night end of a flare from my Mk-3C, I was finally



spotted, or rather, my matrix light was spotted. I had fired a pencil flare but it had failed to ignite. A second and later a third were also duds.

"After I had lit off the night flare, the heat from it began to burn my bare hand. I held it as long as I could, then threw it away. I realized immediately that I should have just dunked it into the sea and saved the daysmoke end. I thought of putting my gloves on for the next flare, then found that my pocket was unzipped and that I had lost them.

"When I was finally spotted, the C-130s dropped parachute flares and a chopper moved in for the pick up. He was low on fuel, however, and had to return to base. The flare he had been using as a pickup aid burned out. A C-130 stayed in the area and flashed its landing lights or fired a green flare when it passed over to signal me that they still had me in sight. I checked in with them every 15 minutes on my radio until it stopped working 45 minutes after the helo left.

"As I lay in the raft I was shivering because the wind had picked up. It had seemed calm when I hit the water. Once I felt a sudden pain on the back of my neck like something had bitten me. The flight surgeon later said it looked like a sting from a jelly fish. The sting burned for a few minutes; then I forgot about it.

"I remembered the PRC-49 radio in the survival equipment pack. After locating the lanyard attached to the pack, I hauled it aboard the raft. The PRC-49 was there but the battery wasn't. I put the pack back over the side. I found the raft lanyard again and located the clip which I had looked for during parachute descent, and clipped it to my torso harness. Apparently I hadn't been able to find it because it had been painted black.

"Since the waves were getting higher, I tried to reason out my plan of action if I was dumped out of my raft. (It was estimated later that the waves were 6 to 8′ increasing to 12′ and that winds were 17 kts, increasing to 23 kts with intermittent rain.) It was at this time that I saw that my Mk-3C was flat. After locating the oral inflation tubes, I managed to unscrew the fittings and blow up the Mk-3C a reasonable amount.

"A second helo finally arrived and spotted me. *(The survivor had actually been located several hours prior to this but rescue attempts were complicated by the bad weather.—Ed.)* I unclipped the raft. The horsecollar sling was dropped and I managed to grab it but it pulled away as I went down a swell. The next time I held on and put my arms through the sling. Then I saw that the cable ran from the helicopter down under the left side of the raft, up the right and then to the top of the sling. I rolled over the right side of the raft, went under it, and was pulled up into the helo. I had been in the water for 5½ hours."

Among the survivor's recommendations were:

- Take off your gloves on the way down. Your sense of touch is better than another set of eyes. *(The new nomex flight gloves should do much to eliminate the problem of slippery, wet gloves.—Ed.)*
- Paint the clip on the raft lanyard silver so it can be seen at night. *(An endorser expressed doubt that paint on the retaining clip would render much assistance at night. The sense of touch recommendation, above, he said, is more advisable.)*
- Pack the Mk-3C life preserver with the oral inflation fittings open. *(This recommendation is not feasible because of the danger of expansion of trapped air at altitude. BACSEB 15-60 refers.)*
- If you can't get rid of your chute before water entry, anticipate that the fittings will be anywhere except where you expect them to be.
- For your next maintenance swim in the pool, try everything when you're exhausted, still hooked to your parachute and tangled in the shroud lines.

In his endorsement, the squadron C.O. noted that the survivor's comments concerning water survival training were similar to those of others who have experienced a bailout at night over water. The C.O. was of the opinion that current swimming requirements are still oriented to conditions more appropriate to ditching or sinking ship situations than those likely to be encountered by jet aviators. The squadron, he wrote, is intensifying its survival training program and is incorporating the information learned from this particular accident.

"Water survival training under the realistic conditions discussed by the board is considered extremely worthwhile in instilling confidence in the equipment in the aviators who must wear it," he wrote. "It is believed that such realistic conditions would be a most convincing argument for wearing the equipment and undoubtedly would reduce complacency. ¡ ."

The C.O. suggested that equipment such as PK-2 rafts and Mk-3C life preservers could be made available from supplies deemed unfit for normal use but serviceable enough for swimming maintenance tests. A subsequent endorsement stated that the feasibility of issuing survival equipment to fleet units for training purposes was being investigated. Deep water environmental survival training has been implemented with a class of 40 trainees a week and will be expanded upon completion of additional facilities, the endorser stated. ◄

NEW jungle penetrator

A new rescue device, the Billy Pugh (BP) Jungle Penetrator, has been procured by the Navy for use by SAR helicopters in the SEA area. The BP Jungle Penetrator is designed especially for jungle rescues and has a slatted fiberglas umbrella to protect the survivor's head and shoulders during hoist through jungle foliage and branches (Photo 1). Photo 2 shows the jungle penetrator in the retracted position for storage in the rescue vehicle. Photo 3 shows the penetrator in the telescoped position but with umbrella and seat paddles stowed.

Figure 1.

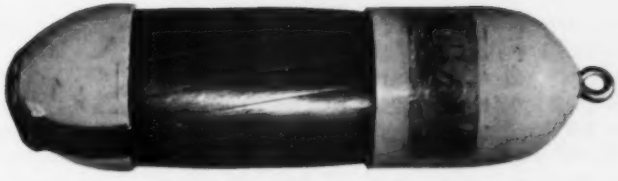


Figure 2.

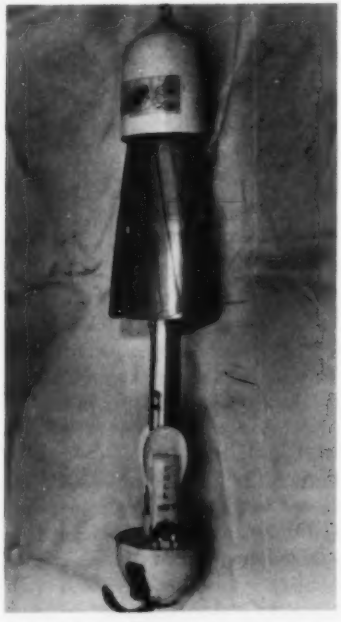


Figure 3.

All occupants of an A-4C and an F-4B which collided in the vicinity of a tanker ejected successfully and were speedily rescued. Here is the F-4 pilot's narrative of his ejection, parachute descent and water survival experiences.

MAN ALIVE

"Moments after joining in a parade position on the starboard side, it happened," he begins. "I saw a flash of an A-4 and immediately felt impact as it hit my port wing. I yelled to my RIO that we'd been hit as I pushed over to avoid hitting my flight leader. Our airspeed at the time of impact was 300 kts and our altitude was 15,000'. The aircraft started to spin to the left and I couldn't control it. I then told my RIO to eject. I didn't have to argue the point —I said 'eject' and he was gone. I followed right after him. I did not transmit a Mayday on the UHF —there didn't seem to be enough time. I wanted to get out before the aircraft began to spin violently and I might possibly be off my seat pan.

"The ejection was what I had expected it would be: a quick ride up the rails, then a violent tumbling followed by the drogue chute stabilization of the seat. A short time after the seat stabilized, I felt the main chute deploy. It did so with a jolt, but it was the nicest jolt you ever want to feel!

Keeps Face Curtain for Souvenir

"I still had the face curtain gripped firmly with both hands. I knew that I wanted to keep it as a souvenir so I held on to it while I surveyed the situation. I didn't seem to be injured in any way and as I looked around I could see the carrier not more than a few miles away. I watched my aircraft spin into the water and saw my RIO's chute which made me feel good. As I swung in the chute I saw the A-4 go into the water in a ball of flames. I then saw the chute of the A-4 pilot for a moment and thanked God we were all still alive.

"Now I began to plan my water entry. I realized that I had been lucky so far and that it was more or less up to me to keep my head and not drown. It was 1415 by my watch. I still had the face curtain in my left hand and decided to tie it to my anti-G suit at the right knee for lack of a better place. After taking my oxygen mask off, I looked around and yelled at my RIO but he couldn't hear me. I spread the risers and pushed my head back to look at that beautiful canopy. The drogue chute and several loose lines (most likely the anti-squid lines) were right above my head. I gathered them all up and tied them to the left riser to prevent getting tangled with them in the water.

Helo and Ship On Way

"Once this was done I looked back down and saw a helo on the way and the plane guard ship heading for the A-4 pilot. I took off my gloves, tucked them into my anti-G suit, raised my helmet visor and tried to relax and enjoy the ride. I wasn't oscillating much and the quietness was broken only by my circling

flight leader. It was a clear day and the view was magnificent. However, I couldn't really relax—I kept thinking about my water entry.

"The sea state appeared to be moderate with ground swells. I decided against inflating my Mk-3C and my raft because I felt they would increase my difficulty in getting rid of my chute and the raft would also increase my oscillation on the way down. (*The current NATOPS states that if time permits the kit should be deployed and the life preserver inflated during the parachute descent.—Ed.*)

Watches RIO Enter Water

"As I approached the water, I saw my RIO, who was a couple of hundred feet below me, enter the water. The helo was already moving in to pick him up. I entered the water feet first, face forward. I realize it should have been back first but I just didn't hack it. I went under several feet, opened my eyes and released my Koch fittings with no difficulty. (However, I did have to make a definite effort to remember the second step in releasing them.)

"As soon as I got my head above water, I tried to swim away from the chute. I didn't seem to be making any headway so I inflated my Mk-3C, released the left rocket jet seat pan fitting and pulled the D-handle on the right side. Then I went back to trying to get away from the parachute shroud lines but I wasn't making much progress and seemed to be caught in them. This was not a healthy situation at all.

Pulls in Lanyard

"With my right hand, I felt for and found the lanyard attached to the seat pan and began pulling it in, hand over hand. When the raft inflated I climbed aboard with no difficulty at all. Once in the raft, I released the shroud lines that were tangled around my right ankle. I got rid of them just before my chute went under. As I looked around, two F4s were circling me and there was a cruiser a few thousand yards away. I pulled the seat pan in, disconnected my oxygen mask and sat back to wait. With the seas about 4 to 5′, I could not see very far. I began to wonder where the helo had gone. When I looked to see what time it was I found my watch was missing; I had lost it some time after entering the water.

Ignites Smoke Signals

"Although I was sure the F-4s had me in sight, I lit a day smoke signal to help the helo find me. After a short while, I saw the helo coming and lit another day smoke to give him wind direction. As he approached, I grabbed my oxygen mask and put my helmet visor down (which I remembered to do from a practice helo pickup I had a year ago.) Then I got out of the raft, swam into the sling, turned around and was hoisted out of the water. I made no effort at all to try and get myself in the helo but let the crewman pull me in. (This I also remembered from the practice helo pickup.) Once aboard the helo, I was happy to see my RIO and the A-4 pilot. I still had my face curtain with me.

"The ride back to the ship was uneventful. We landed on the starboard side while they were still recovering aircraft.

"I would now deploy my raft prior to entering the water even though it might increase the oscillations. Once in the water with the risers free, I would get into the raft . . . I would also recommend that on return to the carrier someone grab you by the arm—no matter how good you feel—and walk you to the flight surgeon. Being as elated as I was, I was slightly oblivious to the operations going on on the flight deck!" ◄

ALCOHOL and FLYING

No matter how acceptable alcohol may be at cocktail parties it has no place in the cockpit. This article describes this threat to safe flying, explaining how it works and what it does to the pilot.

The concentration of alcohol at work in the body depends on the amount of intake and the period of time required for it to be eliminated from the system. This is termed the "blood alcohol level," and is measured in percentage by weight in a given amount of blood. Most state laws in this country define a "presumptive evidence of intoxication" at a blood alcohol level of .150 percent. This actually approaches the staggering stage of bleary-eyed excess. The American Medical Association and the National Committee on Uniform Traffic Laws and Ordinances recommended that this be lowered to .100 percent. In some areas outside the United States, the law provides that .050 percent represents "intoxication."

Some drinkers think a few beers are safe, that the trouble really lies with "hard liquor." They are mistaken. A pint of beer, or a 5½ ounce glass of table wine, has as much alcohol as a jigger of 86 proof whiskey.

The alcohol content of whiskey may be calculated by a simple formula:

Proof ÷ 2 = percent pure alcohol

Percent alcohol × volume consumed = dose

That alcohol dose, from whatever source, is the villain.

Some drinkers believe a heavy person can safely drink more than a thin one. The effect of alcohol can be theoretically calculated according to body bulk. But variation from one person to the next, and even at different times in the same individual, makes this almost an academic exercise when it comes to predicting *safety*.

If only three or four glasses of beer, or as many cocktails, give blood concentrations nearing *legal* intoxication at ground level, how will this amount, or even less, affect a pilot at the controls of an airplane?

Alcohol is absorbed directly into the blood stream from the stomach. The immediacy of this absorption is governed somewhat by the type and strength of the drink and by the dilution caused by other contents in the stomach. However, the total amount of

alcohol taken in a given period of time is the important thing. The initial effect is a sense of warmth from the dilation of the blood vessels near the skin; this rosy-cheeked glow is harmless enough. The true intoxicating effects are brought about by two major actions on the central nervous system.

The first and most profound occurs in the changing of the level and availability of two body chemicals called serotonin and norepinephrine. These chemical compounds, scientifically termed "neurohormones" because they act upon the nervous system, are believed to control mood and alertness. Alcohol causes a change in the proportion of these neurohormones similar to one of the most potent of the new "tranquilizer" types of medications. This explains the potentially hazardous change of attitude or the "mood judgment" effect that has, until lately, been little suspected as a culprit in the cause of accidents. A conscientious and careful pilot may lose his normal attitude of caution long before his skill and performance are affected. This alteration from the normal self, sometimes called relaxation or unwinding, is the first step in the progressive loss of judgment.

The second action is a decrease in the ability of the brain to utilize oxygen. A type of "oxygen need" occurs. With this handicap, the effect of any drink is multiplied by the progressive rarity of the atmosphere above 8000 to 10,000′. Consequently, "two martinis become four at altitude." Thus, uninvited, the high altitude specter of hypoxia silently joins alcohol to compound the cerebral sabotage in progress. When the brain cannot soak up enough oxygen, a decrease of good judgment may follow even a couple of drinks.

In higher concentrations of alcohol (or at higher cabin altitudes) many faculties begin to falter:

The centers of coordination and reflex action become involved. Loss of dexterity, slurred speech and a decrease in the sense of balance and timing begin at this point.

The "thinking-time" may not, however, decay at the same rate as the motor-coordination and reaction time. This holds true for individual mental calculations. But due to the diminished ability to concentrate, the drinker has difficulty in logically maintaining an intact chain of reasoning. An explanation is thus offered for the damage to good judgment previously mentioned. Although the individual may feel that he is thinking normally, this same person is surprised when his lagging reflexes and poorly controlled movements fail adequately to respond to the demands of a "routine situation."

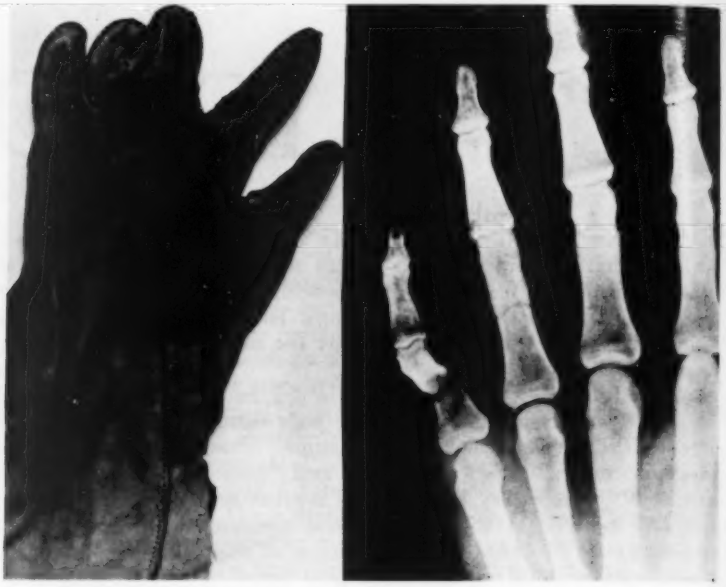
In addition to the effects on mood, judgment, reasoning, coordination, reflex-time and balance, the eyesight is distorted. Even in moderate concentrations of alcohol at ground level, the eyes are directly affected. The field of vision is narrowed and the ability to adapt to the dark is hindered. A complete inability to focus will become apparent in more advanced intoxication.

The body eliminates alcohol at a constant rate, equivalent to about one-third of an ounce an hour, or three hours per shot of whisky. However, the residual effects of drinking, especially in more than small amounts, must be considered. After this period of elimination, there remains an abnormal physiological condition of the body of varying severity depending upon the previous alcoholic intake. This so-called "hangover" is a result of a complexity of reactions by different parts of the body, changes in overall body chemistry and general fatigue. Folklore and bartenders' advice notwithstanding, there is no scientific cure-all except time. This individual is still not his normal self for several additional hours. An aspirin or two might help the headache, but hardly insures that all computer and reflex systems are "go."

Taking any medication before or during flight may generally be regarded as undesirable. This should be discussed thoroughly with your flight surgeon. Further, it must be understood that mixing medication and drinking, even in the smallest amount sets up unpredictable reactions totally incompatible with safe flying. Many medications, even common non-prescription cold remedies, decongestants, and cough syrups may act as strong narcotics or sedatives when combined with alcohol.

Flying and drinking are completely at odds with each other. Combining the two invites disaster. If you do drink, do yourself a favor—allow for recovery time.

—FAA



The photograph and x-ray above are evidence of the protection afforded by properly worn personal survival equipment. The pilot in question was unfortunate enough to have a *Cougar* canopy come full closed on his hand and received two fractures. The squadron flight surgeon reported that the fact that he had his flight gloves on undoubtedly saved his fingers from much more severe lacerations than he received.

"Had he not had this extra ounce of protection," the flight surgeon stated, "it is likely that his recovery time would have been more prolonged and it possibly helped save him from actual loss of a finger."

The glove remained intact in spite of the damage done to the two fingers. *(The slits shown in the photo were made to remove the glove from the injured hand.—Ed.)* The pilot is flying again with full use of his hand.

—Contributed by CAPT R. R. Borowicz, USMC, Aviation Equipment Officer, VT-22

notes from your flight surgeon

Physiological Factors

INVESTIGATION of a wheels up landing accident raised some questions about a student pilot's physiological fitness for the flight. In the 48-hour period preceding the accident, the student had had only three meals. Only one of these could be considered well-balanced. The other two consisted of two hamburgers and a soft drink the day before and a cheese sandwich and a soft drink the afternoon of the accident. This last "meal" was his only food intake in the 23 hours preceding the accident.

The student's sleep pattern was similarly inadequate. Five and one-half hours Wednesday night and four and one-half hours Thursday night did not prepare him for a day as long as Friday, the day of the accident, investigators said. He had been awake for 14 hours and on a duty status for more than 12 of these. A six-hour delay in takeoff due to poor weather merely worsened the situation. The student pilot had no definite idea when the flight would be able to take off. It is well known, the investigating flight surgeon states, that indefinite delays such as this can be as fatiguing as the actual flight, especially for student pilots.

With the possible exception of physiological factors, this accident

followed the classic pattern of pilot error accidents, an endorser wrote, namely the incident of several departures from the normal which occupy the pilot's thought processes and cause him to get behind in the control of his aircraft. The physiological factors involved are harder to evaluate, the endorser continued, but are perhaps the most indirect causal factor.

"Notwithstanding the student's statement that he did not feel fatigued, the contrary appears evident. His taxiing onto the duty runway at 'X' AFB without clearance at the commencement of this particular leg of the flight is indicative of a slowed mental process. Since his record shows him not to be a dullard, fatigue must at least be considered. A most logical conclusion to be drawn from these facts is that the individual is probably not the best judge of his physical condition."

In spite of the fact that students, and their wives, are indoctrinated in the importance of rest and diet in physiological preparation for flight, known instances of inadequate diet and/or rest continue to occur, the endorser points out. Since "how a student feels" is not necessarily indicative of his ability to perform, he continues, an attempt will be made locally to establish definitive standards of rest and food intake as a prerequisite to flight.

Bloody Nose

"I RECEIVED a bloody nose on ejection due to the oxygen mask being torn from my face," the RIO of an F-4J reported after the accident. "I feel this would not have occurred if the oxygen hose was placed under the left shoulder strap enroute to the connection to the upper block. My oxygen hose was routed over the left shoulder strap direct to the upper block."

The *F-4J NATOPS* states: "Warning: The over the shoulder oxygen-communication integrated line must be routed under the shoulder harness to preclude the possibility of the crewmember's helmet being jerked from his head after ejection. This action is caused by the left parachute riser (shoulder harness strap) snapping up against the integrated line with the opening of the personnel parachute."

First Helo Ride

HAVING escaped with some difficulty from an inverted, sinking SH-3A which collided with the water after takeoff, the special crewman made a number of comments on this, his first ride in a helicopter.

"All survival training, especially water training, was, of course, directly useful. The Dilbert Dunker is the most valuable single item of training for naval aviators since if you don't get out, you won't need any other survival skills . . .

"If I were to go through this experience again, I would do things a little differently. Most important, I would make myself more familiar with the aircraft, the emergency exits in particular. It was my fault for not knowing them. Before the flight, one of the crewmen showed me all the hatches and how to open them and said the windows could be kicked out. He answered my questions and was very sincere and able. However here is where I failed: you cannot look at a door and read the instructions on how to open it and stop there. In an emergency you will not have time or you may not even be able to read the words. To train for an emergency, in my opinion, you have got to actually operate the hatch:

"1. Take your crew position and close your eyes.

"2. Keeping your eyes closed while someone watches so you do not get hurt, locate the hatch and open it.

"You should be able to do this with at least two hatches. Picking a guide such as a cable, hydraulic line, etc., will help you find the hatch blind and underwater. I would recommend that each squadron as part of its aircraft training require a blindfold exit under guidance from the aircraft on a periodic basis."

'With my new checklist I never forget a thing.'

Fact Of Life

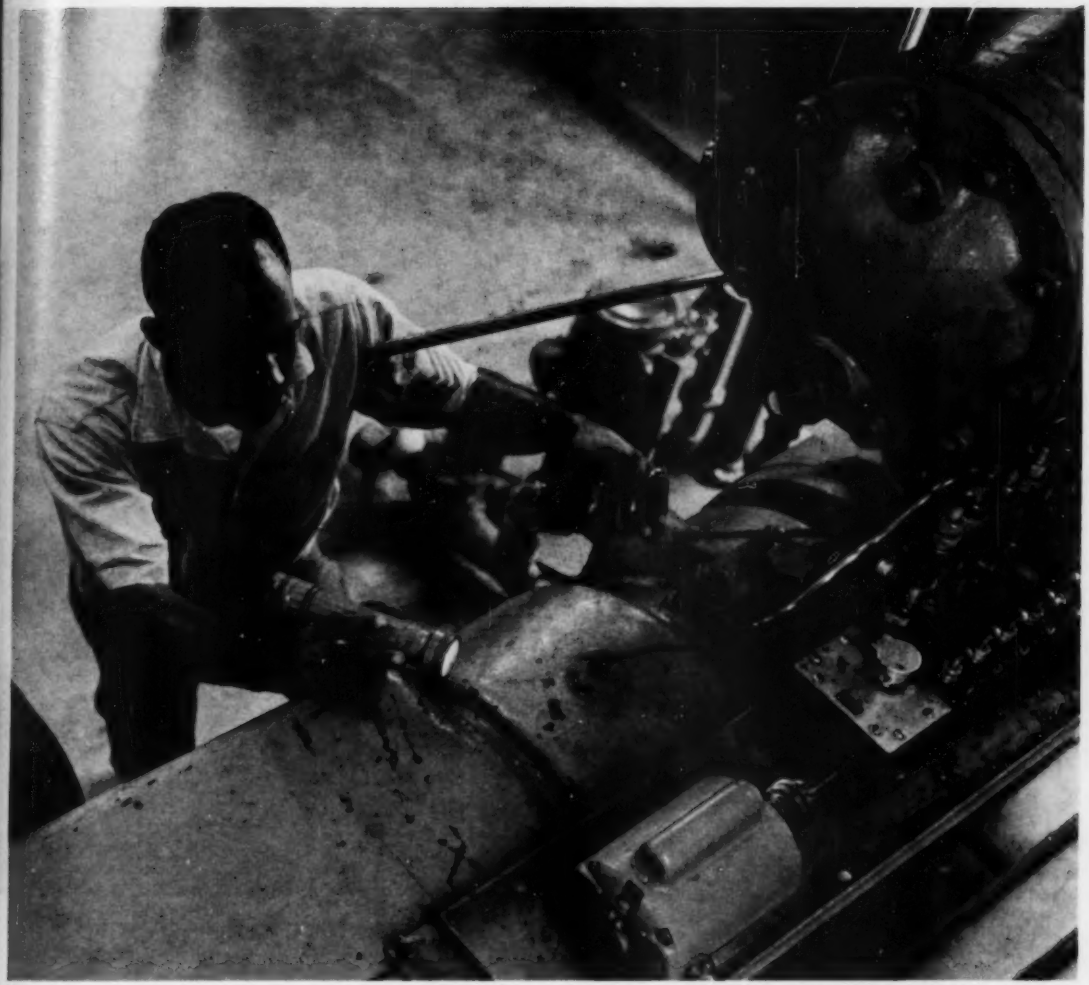
SHORTLY after liftoff, a cargo transport plane with six persons aboard lost its starboard engine because of material failure. No one was injured seriously although the aircraft struck the ground tail first upright, rocked forward on its nose and cartwheeled 180 degrees before coming to rest. The lack of injury was nothing short of remarkable since *no one in the passenger compartment had his shoulder harness fastened.* The aircrewman was aware that the passengers' shoulder harnesses were not secured but because of the seniority of the officers involved through timidity remained silent.

Fact of Life: In an emergency all men are equal.

The Big Switch

from Air to Nitrogen

Nitrogen—A common nonmetallic element that in the free form is normally a colorless, tasteless, insoluble inert gas comprising 78% of the atmosphere by volume, obtained industrially by fractional distillation of liquid air and used chiefly as an inert atmosphere . . .
—*Webster's New International Dictionary, (3rd edition)*



1. Compressor unit crams air to 3000 psi to make 99.5 percent pure nitrogen at NAS Cubi Point for Seventh Fleet.

"All tires shall be inflated with nitrogen only. Do not use air for inflation." This requirement is spelled out in NavWeps 01-245-FDB-2-11 servicing instructions for F-4B, F-4J and RF-4B aircraft.

A requirement such as this for servicing all other aircraft tires, struts and pneudraulic systems can be expected to materialize in the near future accordin to a NavAirSysCom report on its Cryogenic Conference dated 18 January 1968.

Action includes issuance of instructions affirming the use of nitrogen in the servicing of aircraft components instead of high pressure air and instructions requiring discontinued use of air compressors by stations capable of servicing aircraft with nitrogen.

Why in Tires

Since aircraft have become faster and heavier, tire temperatures have become more of a problem because the oxygen in air reacts with the tire rubber at high temperatures and pressures. This causes deterioration, reduces tire life and presents a blowout hazard. In extreme cases it might be an actual fire hazard.

In struts and other pneudraulic components such as accumulators the use of nitrogen precludes the possibility of dieseling at extreme pressures. Another inherent advantage in the use of this inert gas is that corrosive action within the components is reduced by eliminating the presence of oxygen.

Continued

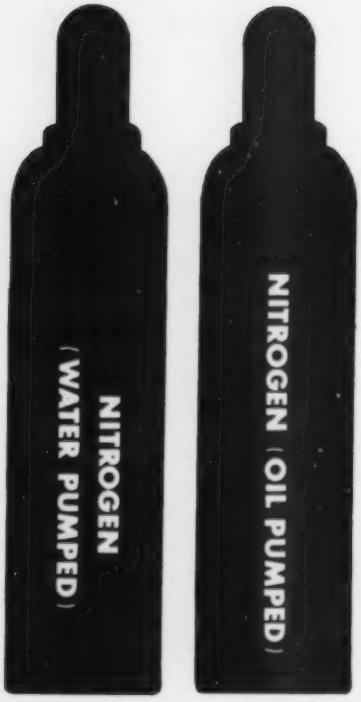


Fig. 1

Water-pumped nitrogen bottles are identified by two black bands on gray and by valves with right-hand inside threads; oil-pumped nitrogen, one black band on gray and by valves with left-hand inside threads.

To insure nitrogen purity a dye test is made.

Two Kinds of Nitrogen

There are two classes of gaseous nitrogen, as spelled out by Federal Specification BB-N-411a. Both are available in military supply. Class I is oil-free. This means that it is compressed by a water-lubricated or nonlubricated pump. It is commonly called "water-pumped nitrogen." This is the nitrogen to use for filling aircraft tires.

Water-pumped nitrogen cylinders are identified as grey with two black bands and are stencilled as shown in Figure 1. The cylinder valves are fitted with right-hand inside threads.

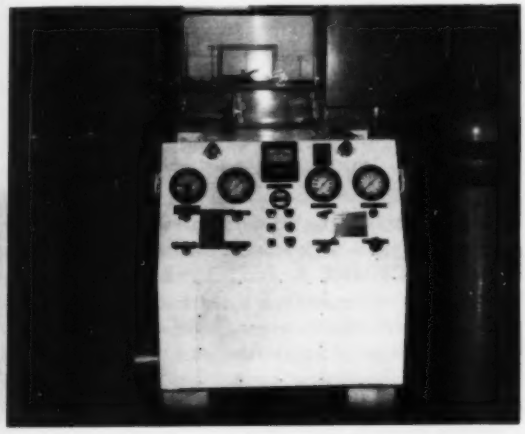
Class II is defined as oil-tolerant nitrogen. This is compressed with an oil-lubricated pump and is commonly called "oil-pumped nitrogen." It may contain up to 0.5 percent contaminants, including entrained oil vapor. Cylinders are identified as grey, one black band and fitted with valves with left-hand inside threads (Figure 1.)

Oil-pumped nitrogen is specified by NavWeps 01-245FDB-2-1.1 for wheel brake accumulators and landing gear struts for F-4B, F-4J and RF-4B series aircraft. But this is expected to change to water-pumped nitrogen with development of facilities for providing same at all ships and stations.

While there are no objections to the use of oil-pumped nitrogen in pneudraulic systems, just having it around presents a safety hazard in that someone will attempt to purge an oxygen system with it. Even with different threads on the bottles some enterprising individual did just that to an A-4. Cleaning of the system then required extensive work by a NARF.

NavAir is currently preparing specifications to provide a standard aircraft system nitrogen purge

Liquid nitrogen in 500-gallon Straza Tank is vaporized before recharging NAN-2 servicing cart.



Liquid nitrogen vapor and charging system.

cart and states that fabrication of such carts by individual activities is not recommended. Procurement will commence during FY 69.

The objection to using Class II nitrogen in tires is that an oil film may build up on the inside of the tires, and soak into the pores of the rubber. This doesn't hurt synthetic rubber, and doesn't present a combustion hazard in the presence of inert nitrogen. But there comes the time when nitrogen is not available and someone uses air. Then we have a hydrocarbon film in contact with compressed air, which is definitely a combustible mixture. This doesn't mean it's an immediate safety hazard but it's less-than-best practice and should be avoided.

What to do if you run out of Class I water-pumped nitrogen? Engineers say it's more preferable to use clean dry air than Class II nitrogen.

Servicing Cart Safety Precautions

The following safety precautions are necessary for the safe operation of the NAN trailer when servicing aircraft systems:

- Only qualified operators should operate the trailer when recharging aircraft. Complete familiarity with the trailer is a basic prerequisite to safe operating techniques.
- Do not permit oil, grease, or readily combustible materials to come in contact with cylinders, valves, regulators, gages, or fittings.
- The recharge hose and aircraft connection fittings shall be thoroughly inspected prior to servicing, and any trace of oil, grease, or foreign material shall be carefully removed.
- The recharge hose should always be bled to insure expulsion of all loose foreign matter from the line prior to connection with the aircraft system.
- Open all valves slowly. When using the trailer for servicing aircraft systems, the danger of rapid charging must be avoided. The acceleration and adiabatic compression of gages in the check valves may result in extremely high temperatures which will initiate oxidation of valve poppet elements.
- Always know the pressure existing in the aircraft system to be filled and the pressures in all cylinders to be used before commencing recharge operation.
- Insure that the line valves on the discharge end of recharge hoses are closed at all times when not actually servicing aircraft.
- The charging hose must never be tightly stretched to reach a connection. Position the trailer so that the recharge hose is not under tension while charging.
- When disconnecting the transfer hose from an aircraft fitting, loosen the connection slowly to prevent rapid bleeding of the trapped gas.
- In locations where hangar space is available, the recharge trailer should be stowed inside during periods of non-use. Where inside storage is impractical, a canvas cover should be fabricated to protect the manifold panel and recharge hose assemblies.
- Caution when moving the trailer from place to place, cylinder valves should be closed.

Reference: NavAir 19-25B-511/15

The story of a water-displacing rust inhibitor and its effectiveness in aircraft corrosion prevention.

MIL-C-23411 for CP

MIL-C-23411 is the military specification for corrosion inhibitors, stocked under FSN 9Z 8030 838 7789. The stuff is made by several manufacturers under a number of trade names with which you may be familiar. It comes in 16-oz aerosol spray cans and its ease of application and portability make it great for corrosion control assists from plane captains. After all, this gent is the key man in your corrosion control program.

Maintenance supervisors say that if you want a product used, put it in an aerosol can. Further, put it in the hands of a plane captain and you've got everything going for you. For years maintenance troops have been fighting a losing battle against corrosion. Here's something which gives them a chance to prevent corrosion from forming quicker than they can cope with it.

It's a clear liquid which penetrates and drives out moisture. Remember, water is the catalyst of corrosion and electrolysis. Imagine water running off a duck's back and then you have a good idea of what this metal protector does when applied to any part of an aircraft. You don't need much—a thin film—the thinner the better to prevent dirt sticking to it. It offers short term protection so it must be applied frequently. On exposed surfaces protection at its best would be 7 days between applications and up to 30 days on internal surfaces which are pro-

tected from direct outside environments.

Corrosion Preventive Compound Mil-C-23411 has an infinite number of uses around aircraft, depending on the corrosion controller's ingenuity. The stuff was first developed for BuShips and was later adapted for the Atlas Missile Program.

Since its application was approved for naval aviation, aircraft corrosion control experts report big dividends if Mil-C-23411 (also a lubricant) is used in following areas:

- piano hinges
- removable fasteners
- B-nuts
- linkages
- cylinder rod end caps
- bolts and nuts
- ejection seat mechanisms
- canopy locks
- control surface hinges
- electrical connectors/couplings
- microswitches
- solenoids
- under galley decks

Avoid using it around oxygen fittings.

Attesting to the effectiveness of this almost-magic potion are the findings of NavAirReworkFac involving the repair of FORRESTAL aircraft exposed to fire, salt water and foam chemical damage. Extensive use of the corrosion inhibitor on electrical and other components limited further damage from corrosion effectively while untreated parts suffered damage requiring complete replacement. This is the first case in which finite observations were made noting the time span from severe exposure to corrosion attack, treatment, effect of treatment, and required repairs. Almost a laboratory-controlled test, unintentional, of course.

The Royal Navy's *"Cockpit,"* their Fleet Air Arm Safety Review, reports even more dramatic experiences with one of the products made under the Mil Spec.

Following the ditching of an aircraft at sea, it was retrieved, washed down and treated with the magic potion. The treatment was successful and no further corrosion has taken place. The aircraft is expected to fly again before the year is over.

A helo which was recovered after ditching also reveived the treatment. The report following the aircraft's return stated: "All sound surfaces that received treatment were completely corrosion-free and there were no signs of significant growth in the areas thought to be already corroded before immersion."

Acknowledging the foregoing as spectacular, the *"Cockpit"* also reported equally good results in day-to-day use. Two *Sea Vixens* were shipped out to the Far East as deck cargo protected only with the elixir. They arrived free from corrosion. It is easy to imagine how much time and expense were saved in preparing the aircraft for shipment and for flight. Treatment of aircraft in squadrons can make life easier for mechs and reduce the work required at PAR.

At this point, users of Mil-C-23411 should be well aware of its capabilities—and limitations. Remember it's just one of the tools for your anticorrosion program. Refer to your maintenance instructions for the complete listing but be sure to put this one high on the list. Again, that stock number is 9Z 8030 838 7789.

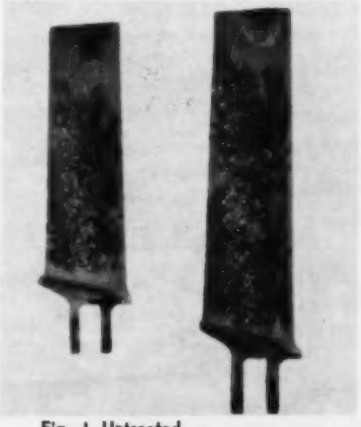


Fig. 1 Untreated

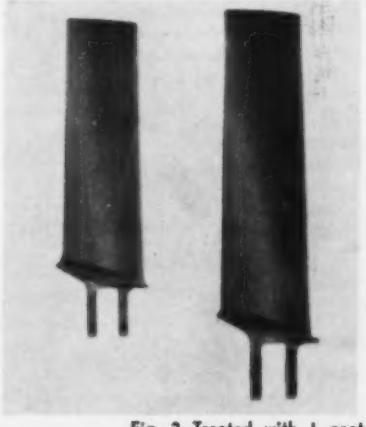


Fig. 2 Treated with 1 coat

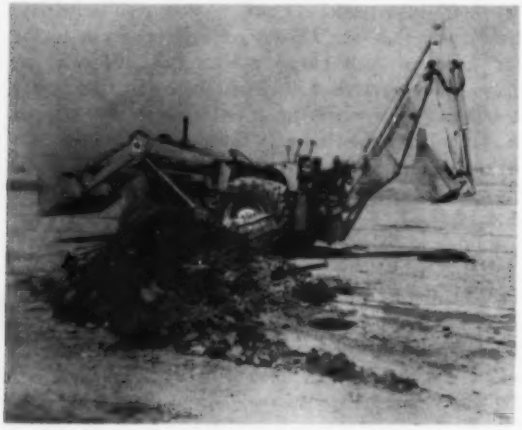
Both sets of compressor blades were subjected to a 10-day salt spray test by a Royal Navy Laboratory. The benefit derived from just 1 coat of Mil-C-23411 compound is clearly demonstrated.

NOTES

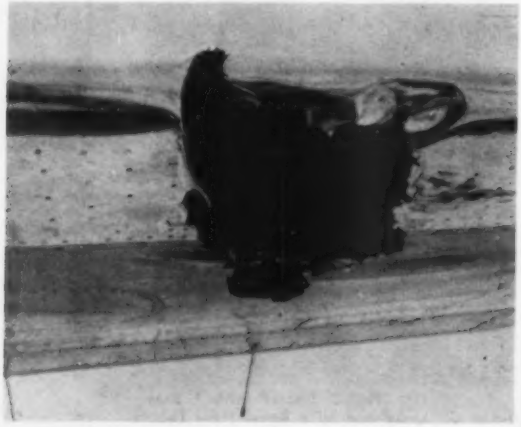
and comments on maintenance

Watch *Both* Wingtips

THE qualified plane captain was taxiing his C-130F, alone, to the warm-up area for the daily preflight. In the haste to keep on schedule, he also did not wait for wing-walker assistance as per squadron SOP. Some taxiway repair required the presence of a ditch digger machine which forced the large aircraft to move close to the hangar. Suddenly, the plane captain realized that the starboard wing was dangerously close to the hangar which caused him to forget about the close proximity of the ditch digger equipment to the other wing. Consequently, he initiated a slight port turn. He missed the hangar but—he gashed the port wing on the top of the ditch digger.



How can you miss (or hit) this monster?

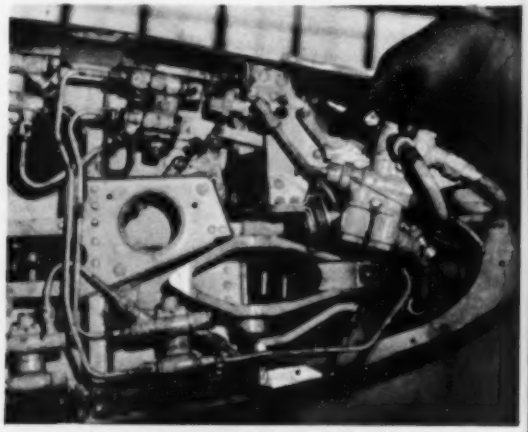


. . . Repairing this gash will cause a lot of extra work.

The *Hercules* is a pretty big airplane for one man to taxi under ideal conditions—and to do it without the help of wing-walkers puts the whole mess under the title of gross negligence. Every squadron has precise taxi SOPs for good reasons—and this incident is a very good example.

Accidental Wing Spread Damage

AN S-2F was undergoing its fifth calendar inspection. Among items repaired was a leaking starboard wing-lock hydraulic cylinder. All components repaired and checked items were, presumably, certified as properly completed so the aircraft was towed to



A disengaged wing-lock lock . . .

. . . can cause extensive wing damage.

the line for the final engine turnup checks.

As soon as the port engine (the first to be turned) was started, the starboard wing began to spread although the cockpit selector was in the FOLD detent. As the wing reached the near vertical position, hydraulic fluid was noted to be spraying from the butt area by the fire watchman. The man holding the fire bottle quickly signaled the plane captain in the cockpit to secure the engine. The engine was quickly secured, but by this time, the wing had passed the vertical position. The wing continued spreading by gravity force and caused considerable damage because of the wing-lock lock system being out of sequence.

The cause of this mishap was traced to faulty reinstallation of the wingfold spread actuating cylinder. Additionally, the required functional checks and integrity inspection were not properly accomplished. These required checks and double-checks are designed to prevent such maintenance errors as this.

Crash Crew, Note!

WHEN an A-3D lost an engine 60 miles from homeplate, the midfield E-5 arresting gear was rigged and crash equipment was called to stand by.

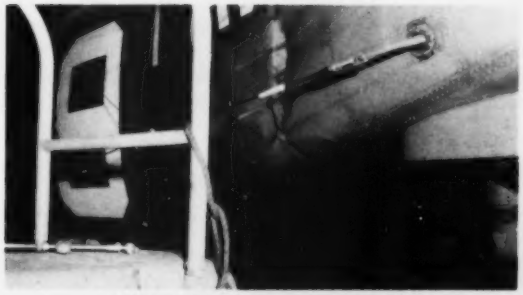
The arrestment was made, and as the aircraft was still rolling out dragging chain, one of the fire trucks proceeded out onto the runway behind the aircraft and started to follow it.

Almost immediately a loud noise was heard, as some unknown object struck the vehicle. The object entered at the top right side of the windshield, ricocheted off the roof, went through the metal rear of the drivers cab, continued into the paneled body and exited through the metal side of the body. (The object could not be located later.)

The occupants of the cab received minor cuts and bruises from the flying glass. If the object had struck either one of them, it would have caused a serious injury.

It should be emphasized that during an engagement, all crash equipment should remain clear of the runway until the aircraft has come to a stop. Following a rolling aircraft still dragging chain could prove disastrous.

Wild Fork Lift



Helo and forklift are not compatible.

Airframes mechanic, front and center.

THE CARRIER was plowing through moderate seas and all aircraft were well secured according to SOP. A nearby forklift was not given the same care while parked, although the brakes were set and the fork was left to drag on the deck. The ship heaved excessively and the bulky little truck smashed into a helo, causing considerable skin damage.

Carrier experience through the years has clearly indicated that anything designed to roll will do so at most inopportune times unless it is chocked and tied down. Here is a case where the brakes were obviously weak and the fork proved unreliable as a drag. Shipboard operations must be conducted under stringent tie-down requirements and until some one thinks of more reliable securing devices, the tedious system must be adhered to. ◄

MURPHY'S LAW*

F-8 Double Murphy

Following maintenance in which a variable incidence wing actuator was changed, takeoff and wing transition on the F-8 seemed normal, but on his return to the field for landing the pilot could not raise the wing. Inflight examination by the pilot of another aircraft revealed that the wing was unseated and raised about 1½".

The wing incidence locking lever could not be pulled out of the detent, but could be moved aft about ½". A wing-down landing was made into the long field E-27 arresting gear.

Troubleshooters found cable assemblies 313R1694 and NAS 313R17-100 of the two-position wing cylinder mechanism installed in *reverse* order. This caused locking collar pulley assembly 6507556 to rotate in the opposite direction, eliminating the safety feature in the cylinder assembly which normally prevents the locking collar from rotating until the wing is fully DOWN. This also resulted in a partially locked down condition with the wing DOWN and the locking lever in LOCKED.

On the next flight after the fix, a wing/wheel/droop light indicated UNSAFE following takeoff so the pilot promptly aborted. The fix this time consisted of rewiring the down-lock switch 4HSZ6 in order to get the warning light to correspond with the wing-lock handle position. This action resulted in wiring the switch completely out of the system because the locking collar was opposite to the proper direction. Normally, the light goes out when the switch is depressed by the rotation of the locking collar to the locked position. In this case the switch was wired so that the light was out when the condition of the landing gear, droops and wings were compatible, regardless of the locking collar position.

The second flight was uneventful with the wing incidence actuator apparently operating normally, although the warning light was not operating and the wing was only partially locked down. Neither factor could be determined by the pilot from cockpit indications. But the third flight revealed the double Murphy.

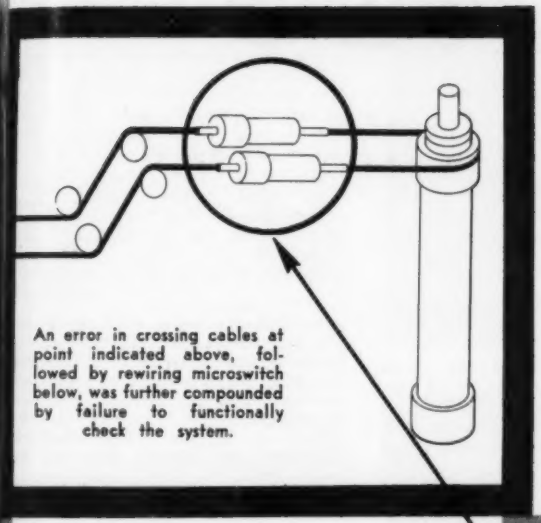
When the pilot moved the wing locking lever to LOCKED before the wing was fully DOWN, this

Stamp out Murphy's Law!

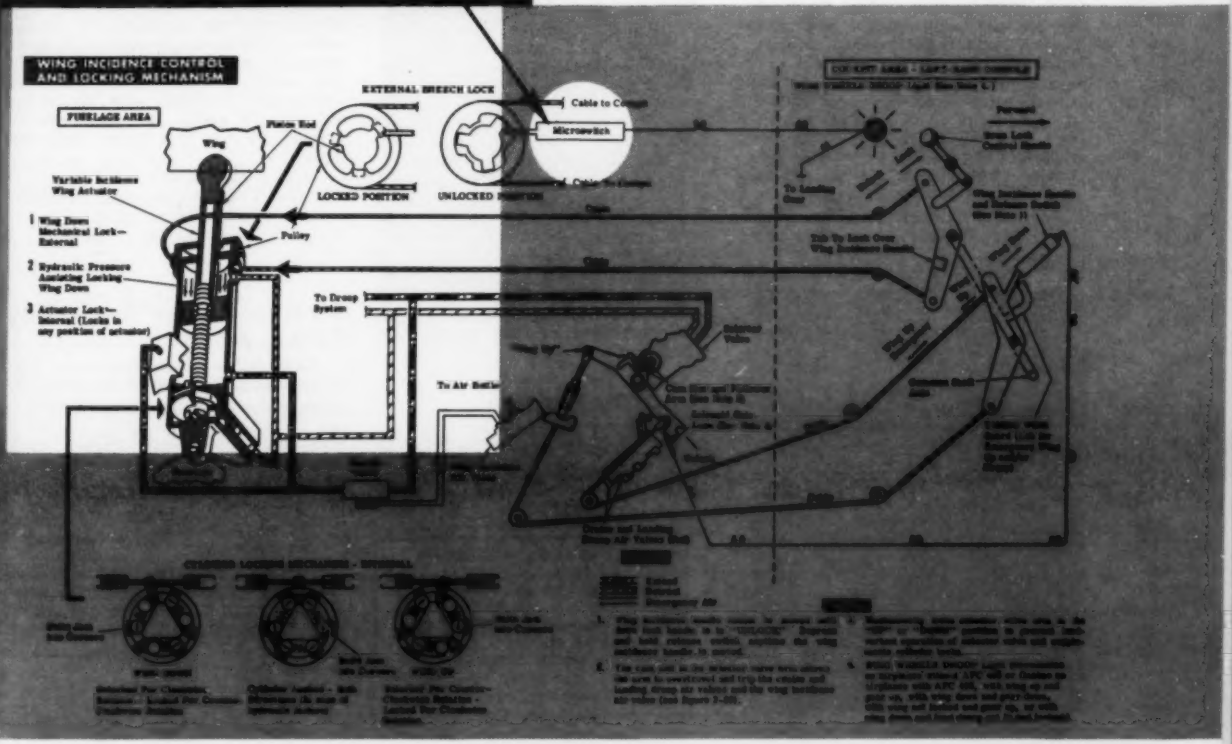
* If an aircraft part can be installed incorrectly, someone will install it that way!

allowed the locking lugs on the wing cylinder to jam on top of the locking lugs of the locking collar. The pilot was unable to raise the wing since the wing incidence position lever cannot be moved unless the mechanical locking lever is out of the locked detent and moved slightly aft. The mechanical locking lever could not be moved due to the jammed locking lugs which prevented the locking collar from rotating.

The reporting C. O. stated that if the rigging tool is inserted into the actuator prior to connecting the lock collar cables, incorrect installation will not be possible. The C. O. commented further that Murphying the wing incidence cables and fouling it up further by rewiring warning lights, which up until then had been working properly, so that the entire rig would appear normal is a classic example of how-not-to-troubleshoot. Seems there's a lesson here. A functional check is always required whenever a hydraulic component is changed. This action is called out in the HIR (Handbook of Inspection Requirements).



An error in crossing cables at point indicated above, followed by rewiring microswitch below, was further compounded by failure to functionally check the system.



Letters

Ordnance Error

FPO San Francisco.—I wish to call your attention to the article concerning the Naval Air Test Center in the January 1968 issue of APPROACH magazine. Specifically, the portion titled "A Test Involving All Divisions." The article states that an A-4E aircraft was carrying 5 Mk-77 Mod 3 fire bombs, one on each parent rack, with the AWRS system set in ripple pairs and 100 milliseconds. It goes on to say that the centerline fire bomb failed to release because the pilot released the bomb pickle before it had time to generate a third pulse.

According to the NATOPS manual, page VII-9, the centerline store cannot release in the ripple pair mode because there is not another station of equal priority.

LTJG JOHN GOODMAN
VA-194

• A recheck of the facts concerning the subject accident revealed that you are right. Thank you for detecting this error.

Magazine Murphy

NAS Whidbey Island—Upon picking up the January 1968 issue of your magazine, several of us Attack Squaddron FIFTY-TWO "Knightriders" thought we were experiencing complete and total eye failure. However, it now appears that Murphy's Law can also be applied to the way publishers affix the covers to their publications. Let's see now, is it backwards or upside down?

VA-52 QUALITY CONTROL

• Both in this case. The magazine that VA-52 returned to us was inserted in its cover upside down and backwards. A check with the printer revealed that this was probably an isolated case, but binding machines do have their idiosyncrasies on occasion. The issue has been given a suitable spot in our museum of memorabilia and a replacement copy is on its way. If anyone else receives a faulty copy of this or any issue, we'll be most happy to replace it.

Locally-Fabricated Vacuum Cleaner Specs

APO San Francisco—US Army aviators throughout the world are avid readers of your outstanding and highly professional publication APPROACH. I would like to count myself among their number.

I recall seeing an article some years back which gave detailed information on the fabrication of a vacuum device for cleaning aircraft. However, my memory fails me as to the specific issue. Request that you provide the date of publication or a copy of the article.

MAJ ALFRED J. ILLER
HQS 7TH SQDN, 17TH CAV

• Details for the locally-fabricated, compressed-air-operated vacuum cleaner first appeared in the March 1957 APPROACH. Since that issue is out of print you are being sent a copy of the original NARF NorVa Drawing PE-5-767-F.

The representative views of Army aviators toward the magazine expressed in your letter were warmly received.

Crash Rescue Info

Waimea, Hawaii—Flight line mechanics here at the Pacific Missile Range assist Crash/Fire crews and have a need for information and charts on D-18, H-3, S-2F, C-1A, C-47, C-121, C-54, T-102, C-130, C-118, U-16, H-34, C-124, EC-121, P-2, P-3, T-33 and U-8 aircraft. Please send manuals or publications that might help us in setting up clear-cut procedures when an emergency occurs.

P. S. YAMAGUCHI

• Wish we could send them to you but the latest information on Crash/Rescue and Fire Fighting is being updated and is expected to be published shortly. In the meantime, refer to NavAir 00-80R-14, U. S. Navy Aircraft Fire Fighting and Rescue Manual, 15 Sept 1962.

The new NavAir 00-80R-14 covers most of the aircraft you cite, including a listing of applicable references, training syllabi, areas of responsibility, fire fighting and rescue techniques, and equippage for ship and shore facilities. To order the new NavAir 00-80R-14, use DD Form 1348 and mail to:

Chief of Naval Operations
Flight Training Branch OP563C
Navy Department
Washington, D. C. 20350

How to Procure the O-Ring Fitting Kit

NAS Dallas—Your November 1967 issue has a fine article on hydraulic seals and how to put them on properly. On attempting to order the kit I ran into trouble—our supply could not find the kit in the system. Please let us know where supply can obtain this kit.

GYSGT D. L. PARISH
MARTD MARTC

• This GSA item is stocked and distributed by the manufacturer. Supply's purchase order for ORFit Kit FSN 9Q-5120-937, Contract No. GS-00S-68629 should be directed to:

Wencor, Inc.
P. O. Box 491
Miami Springs, Florida 33166

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

An ounce of cooperation is worth a pound of argument.—Anon.

Poopy Suit Holder

FPO, San Francisco—As safety officer of a Pacific Fleet P-3 squadron, I am concerned with the various phases of different survival conditions the average crewmember faces on an operational flight. One of these phases is the possible exposure to water/air temperature conditions which can vary from the warm Hawaiian waters to the freezing waters off Adak in just a matter of a few flying minutes with the P-3.

A campaign for a better way to stow survival and associated flight gear has been emphasized in this squadron. The idea is to stow gear in an area that is accessible to everybody simultaneously and in such a manner as to eliminate moments of mass confusion that might occur in a ditching situation.

The enclosed photographs are the result of an idea submitted by ADJ1 R. A. Thaut, a flight engineer attached to PATRON FOUR. The idea was studied and PRC W. F. Cutler of PATRON FOUR designed the holder for the QD2, the quick-donning anti-exposure suit.

Wide dissemination of this idea may help other squadrons in finding a suitable storage area for the QD2 in their P-3s. The small amount of materials and time required to construct the holder makes fabrication feasible at the squadron level.

LCDR D. A. COX
ASO, VP-4

Materials required:

1. One piece 9″ x 26″ nylon duck
2. Yellow binding tape
3. 54″ of 1¼″ webbing
4. 2 each "Lift the Dot" fasteners
5. Velcro tape

Time to fabricate: .5 of an hour

To manufacture:

1. Bind the 9″ nylon duck with yellow binding tape.
2. Take two pieces of 1¼″ webbing 29″ long and form a 2″ loop at one end of each.
3. Sew the webbing to the nylon duck starting from the loop end of the webbing and edge of the nylon duck. Sew down 15″ on webbing and 2″ in from edge of nylon duck.
4. Sew velcro tape pile along edge under the loops.
5. Sew velcro tape hooks 2½″ on opposite side and on end away from loops.
6. Make cross strap with 7″ piece of webbing sewn 6″ from end opposite the loops and anchored at both ends and center.
7. Install "Lift the Dot" fasteners on end of webbing 26″ apart.
8. Sew on two pieces of yellow nylon tape, one 5″ and one 7″, and stencil as shown.

To install:

1. Pass the loose ends of webbing under and around the bar at the bottom of aircraft seat.
2. Pass the ends under the cross webbing and snap the "Lift the Dot" fasteners and velcro tape.

To release:

1. Lift the "Lift the Dot" fasteners
2. Pull down on the loop end and anti-exposure suit falls out.

Photo 1

Photo 2

• This suggestion was forwarded by the commanding officer of VP-4. Enclosed were a number of photographs, three of which are shown here. Photo 1 shows the two components of the VP-4 method of stowing the QD2 anti-exposure suit. Photos 2 and 3 are side and back views of a seat with the suit bag installed.

Photo 3

Vol 13 **approach** No. 11

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

CONTENTS

DEPARTMENTS

NavAir 00-75-510
CREDITS

Cover Painting—A Pair of F-8s Close in for the Kill, by Blake Rader.

IFC, Photo by Art Schoeni and decal courtesy LTV, Inc.

Pg. 3, Photo courtesy VFP-63

Pgs. 7-9, Photos courtesy author

Pg. 32, Cartoon courtesy Don Lauer

Pg. 41, Photos courtesy the Royal Navy Cockpit

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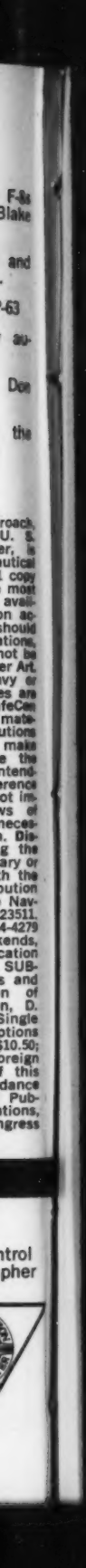
Next Month

A Collection of Midairs

and other items of interest to the Naval Aviator.



A Look at Things to Come: Summer Flying

The news media on radio, television and in the newspapers are reporting daily occurrences of weather damage from disaster scenes throughout the country and we read of frightening experiences occurring on board military as well as civil aircraft. These events are all associated with the approach of warm weather violence.

Warm weather phenomena can be awesome and frightening but their causes must not be attributed to unknown forces by the professional naval aviator. The fury and violence of thunderstorms and frontal weather must be studied and understood. Education about inclement weather flying is most effective as a part of the training and lecture programs instituted during the months preceding summer while snow and winter are still a way of daily living for many.

Experience in severe weather flying is gained by necessity more often than by design and planning. No pilot should knowingly fly into severe weather or into a thunderstorm if the mission does not demand that this be done. The experiences of those who have had severe weather encounters are meant to be shared with those who have not met with nature's fury. Discussions in the squadron, especially between the "old pros" and the "youngsters" are most helpful and desirable.

Preparation for the coming season must naturally include a thorough review of aircraft systems and aircraft limitations. The electrical system is, perhaps, one of the most critical areas and also the most vulnerable to severe weather encounters. Lightning, turbulence and icing, typical of thunderstorms and frontal systems, can strain electrical systems and quickly affect the electrical capacity of the plane. Severe icing is often reported by squadrons during the summer months when frontal systems are penetrated at lower as well as higher altitudes. Turbulence, not unlike that associated with the boundaries of the jet stream, is common to such weather phenomena.

The summer weather period can be traversed safely if preparation is adequate. The increasing cost of modern aircraft and the inestimable value of pilots and trained men make "standing still in aviation safety a losing game!"

Plan now.

—Adapted from a WingsLant Safety Msg.

MECH, now appearing every three months, needs material.

Send your stories, articles and ideas to:

Editor, APPROACH
U.S. Naval Aviation Safety Center
NAS Norfolk, Va. 23511